Public Works Department
Bombay Presidency

Irrigation Administration Report

Part I—Deccan and Gujarat

For the Year 1929-30

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DIAGRAM

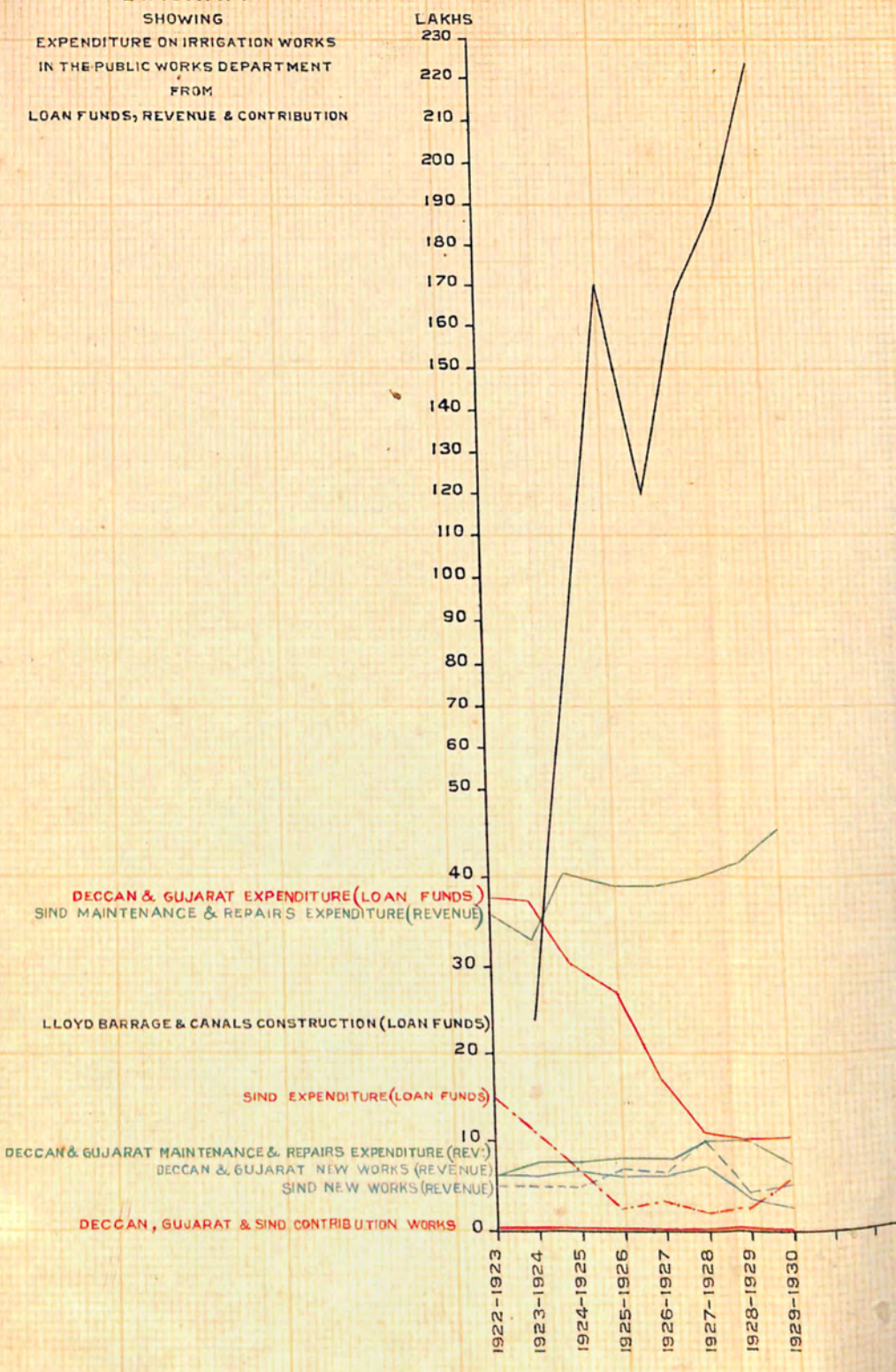
SHOWING

EXPENDITURE ON IRRIGATION WORKS

IN THE PUBLIC WORKS DEPARTMENT

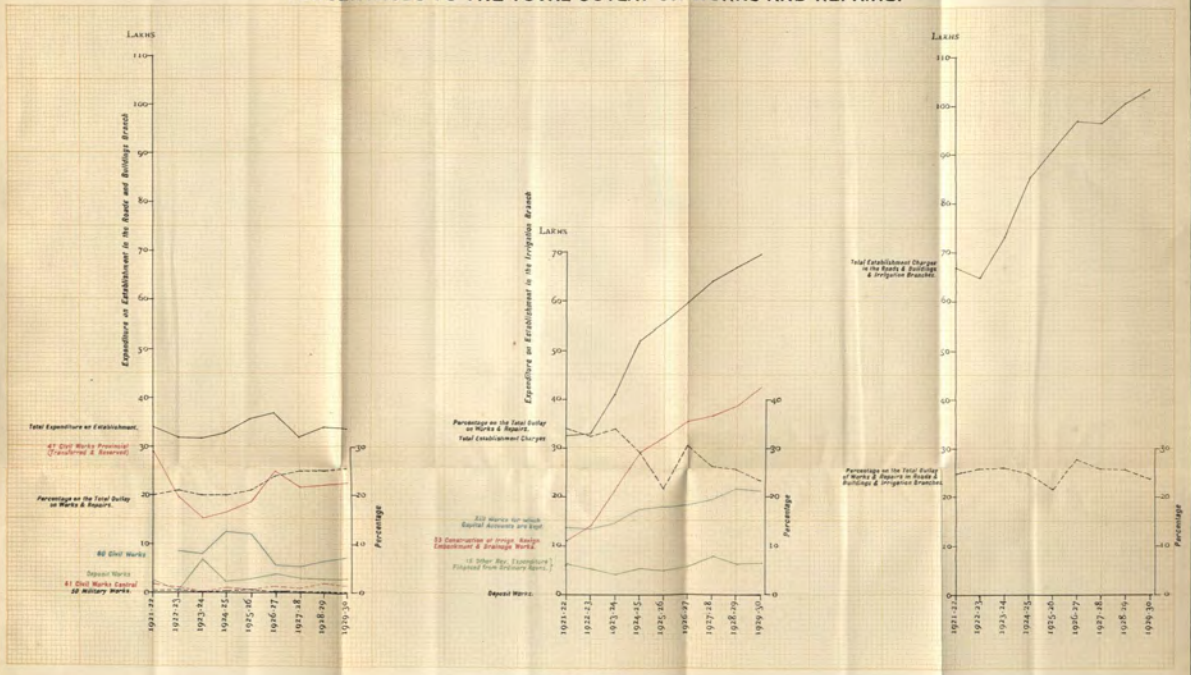
FROM

LOAN FUNDS, REVENUE & CONTRIBUTION



G. P. Z. O. Poona, 1931.

DIAGRAM SHOWING EXPENDITURE
ON ESTABLISHMENT
IN THE
ROADS & BUILDINGS & IRRIGATION BRANCHES
OF THE
PUBLIC WORKS DEPARTMENT
AND
PERCENTAGES TO THE TOTAL OUTLAY ON WORKS AND REPAIRS.



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IRRIGATION ADMINISTRATION REPORT
PART I—DECCAN AND GUJARAT
1929-30

PHYSICAL FEATURES—GENERAL DESCRIPTION OF IRRIGATION.

Irrigation in the Deccan and Gujarat differs materially from that in Sind. Rainfall is available for agricultural operations but is often precarious. Tanks and canals provide irrigation to valuable crops such as sugarcane and are a source of supply to other crops also when the rainfall is deficient or irregular. The old irrigation works consist chiefly of a few small canals and moderately large tanks, some 12,000 smaller tanks mostly in the southern part and in Gujarat, and of about 400 bandharas in Nasik and Khandesh Districts. The tanks have earthen dams and the larger ones irrigate areas up to 1,300 acres, and the smaller ones up to 500 acres, situated immediately below and in the vicinity of the dams. The chief crop irrigated is rice. The bandharas are masonry weirs built across rivers to head up the water to a level sufficient to irrigate lands on the banks of the streams by means of channels taking off from the flanks of the bandharas. The areas irrigated are up to 800 acres and the chief crops are sugarcane, wheat, bajri and gram. From the small beginnings of the tank have evolved the magnificent irrigation works which now form such a conspicuous feature in the Deccan and have so successfully fulfilled their beneficent purpose in banishing the famines which formerly devastated this portion of the Province.

2. The irrigation works in the Deccan are fundamentally different from those in Sind, the Punjab, Egypt or Mesopotamia, where wide alluvial plains have been formed by great deltaic rivers in perennial flow. The Bombay Deccan consists of a sloping table-land running eastward from the ridge of the great geographical feature of Western India—the Western Ghats. These form a ridge running parallel to the sea-coast at a distance of 50 to 100 miles from it; precipitous on the western side, they fall away more gradually to the east. The heaviest rainfall occurs on the peak of the Ghat ridge, where anything up to 250 inches or more of rain are recorded in the four monsoon months. The intensity of the rainfall rapidly decreases as we go eastward from the highest ridge, reaching a figure of 20 or 25 inches at a distance of 100 or 150 miles east of the Ghats. The rivers in the Deccan rise in the valleys close to the ridge, flow in an eastward direction, and are dry or practically so for 7 or 8 months of the year. The line of the Ghats, like the ridge of a roof, divides the rainfall into two parts; the smaller portion falls westward into the Indian Ocean, and the larger flows through long lengths of tortuous rivers to the east and joins the rivers which reach the sea on the south-eastern coast of the peninsula. These rivers are in flow during the monsoon months only, and if no artificial means of conserving their waters were provided, the whole monsoon rainfall would

be wasted so far as the Bombay Deccan is concerned, and would simply flow away to the sea, benefiting but a small extent of the country traversed.

3. The large irrigation systems in the Deccan are all of the same type. Each depends upon a storage lake near the head of one of the river valleys, where sufficient water is collected during the monsoon to supply the country on either side of the river valley below. The water stored during the rains is let out during the dry months of the year in accordance with requirements; and at a point on the river, which may be as far as 50 miles from the main storage lake, a 'pick-up-weir' is constructed across the river-course to divert the water into canals taking off on either side of the weir. In one case only, that of Lake Fife at Khadakwasla near Poona, do the canals take off from the flanks of the dam itself. The canals are always constructed at a considerably flatter slope than that of the river, and consequently are able to diverge from the river itself on each side of the valley; as a rule each canal only irrigates the area between itself and the river.

SECTION I

COMPRISING IRRIGATION WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

Works in operation.

4. The following list includes all the works in operation (43 in number) :—

Serial Number	Name of Work	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec	Whether supply is reliable or dependent on local rain	Whether storage works completed or proposed	Remarks
		Acres			
1	Hathmati and Khari Cut Canals.	24,000	Dependent on local rain.	No storage work. Bokh reservoir, Chandola tank and Wasai reservoir completed.	The catchment of the Hathmati river is hilly, covered partly with forest and that of Khari is undulating ground at its source and then plain ground with cultivated fields. Supply depends upon the flow in the rivers, and the contents of the Bokh reservoir, Chandola tank and Wasai reservoir.
2	Wangroli Tank ..	3,400	Do. ..	Completed ..	Ordinary catchment on plain ground and cultivated fields.
3	Savli Tank ..	3,000	Do. ..	Do. ..	Ordinary catchment on undulating ground.
4	Saiat Tank ..	2,000	Do. ..	Do. ..	Ordinary catchment on flat ground.
5	Tranza Nagrama Tanks.	800	Do. ..	Do. ..	The Tranza tank has no independent catchment. The Nagrama has a catchment of 1·5 sq. miles. Both are fed by the Matar drainage channel which is not reliable as it seldom flows.
6	Futelao Tank ..	800	Do. ..	Do. ..	Hilly catchment.
7	Nira Left Bank Canal including Shetphal Tank.	100,000	Reliable ..	Lake Whiting (Lloyd Dam) completed.	Ghat catchment.
8	Nira Right Bank Canal.	180,000	Do. ..	Do. ..	Do.
9	Mhaswad Tank ..	14,000	Dependent on local rain.	Completed ..	Deccan catchment.
10	Mutha Canals including Matoba Tank.	49,000	Reliable ..	Lake Fife completed.	Ghat catchment.
11	Kasurdi Tank ..	40	Dependent on local rain.	Completed ..	Deccan catchment.
12	Shirsuphal Tank ..	1,150	Do. ..	Do. ..	Do.
13	Bhadalvadi Tank ..	1,225	Do. ..	Do. ..	Do.

Serial Number	Name of Work	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec	Whether supply is reliable or dependent on local rain	Whether storage works completed or proposed	Remarks
		Acres			
14	Godavari Right Bank Canal.	44,000	Reliable ..	Lake Beale completed.	Ghat catchment.
	Godavari Left Bank Canal.	26,000			
15	Pravara Right Bank Canal.	18,480	Do. ..	Lake Arthur Hill (Wilson Dam) completed.	Do.
	Pravara Left Bank Canal.	64,080			
16	Girna Left Bank Canal.	9,000	Do. ..	Chankapur Tank completed.	Do.
17	Kadwa River Works. Palkhed Canal	6,600	Do. ..	Waghad Tank completed.	Do.
	Kadwa River Works. Ojhar Tambat Canal				
	Kadwa River Works. Wadali Canal	1,080	Do. ..		
18	Parsul Tank ..	1,440	Dependent on local rain.	Completed ..	Deccan catchment.
19	Ekruk Tank ..	13,070	Do. ..	Do. ..	Do.
20	Koregaon Tank ..	416	Do. ..	Do. ..	Hilly catchment.
21	Ashti Tank ..	3,382	Do. ..	Do. ..	Deccan catchment.
22	Pathri Tank ..	3,094	Do. ..	Do. ..	Hilly catchment.
23	Bhatodi Tank ..	1,461	Do. ..	Do. ..	Deccan catchment.
24	Jamda Canals ..	42,000	Girna river supply not reliable.	Water is issued from the Chankapur Tank when available.	Ghat catchment for a small part and for the rest Deccan catchment.
25	Hartala Tank ..	978	Dependent on local rain.	Completed ..	Deccan catchment.
26	Mhaswa Tank ..	3,256	Do. ..	Do. ..	Do.
27	Shahada Channel ..	2,000	Reliable ..	No storage work ..	Hilly catchment. Supply is perennial.
28	Lower Panjhra River Works.	8,173	Panjhra river supply not reliable.	Mukti Tank completed.	Ghat catchment for one part and Deccan catchment for the rest.
29	Krishna Canal	6,412	Reliable ..	Proposed ..	Ghat catchment.
30	Rewari Canal ..	439	Dependent on local rain.	No storage work ..	Deccan catchment.
31	Upper Man River Works.	373	Do. ..	Pingli Tank completed.	Do.
32	Yerla River Irrigation Works.	1,182	Do. ..	Nehr Tank completed.	Do.
33	Chikhli Canal ..	358	Do. ..	No storage work.	Do.
34	Maini Tank ..	455	Do. ..	Completed ..	Do.
35	Muchkundi Tank ..	750	Do. ..	Do. ..	Do.

Serial Number	Name of Work	Area of four months' crops which could be irrigated in normal years with a duty at the head of the canal of 120 acres for the monsoon and 120 acres for the rabi season per cusec	Whether supply is reliable or dependent on local rain	Whether storage works completed or proposed.	Remarks.
		Acres.			
36	Gadikeri Tank ..	416	Dependent on local rain.	Completed ..	Deccan catchment.
37	Gokak Canal ..	17,627	Reliable ..	Do. ..	Ghat catchment.
38	Dambal Tank ..	531	Dependent on local rain.	Do. ..	Deccan catchment.
39	Medleri Tank ..	231	Do. ..	Do. ..	Do.
40	Madag Tank ..	1,418	Do. ..	Do. ..	Ghat and Forest catchment
41	Asundi Tank ..	303	Do. ..	Do.	Deccan catchment.
42	Mavinkop Tank ..	617	Do. ..	Do. ..	Forest catchment.
43	Dharma Canal ..	For monsoon season 6,580 acres. For rabi nil.	Do. ..	No storage work. The canal takes off from the river itself.	Do.

Gadikeri tank, Mavinkop tank and Shahada channel are the only productive works and the rest are unproductive.

5. The interest account for the year stands as follows :—

	Productive Works	Unproductive Works	Total
	Rs.	Rs.	Rs.
Total interest charges during 1929-30 ..	5,691	40,34,495	40,40,186
Net revenue realised during 1929-30 ..	1,848	13,14,070	13,15,918

Net loss, i.e. difference between interest and net revenue—Rs. 27,24,268.

6. The gross revenue realised from all sources during the year after deducting refunds of revenue (Rs. 30,465) amounted to Rs. 30,29,352 of which Rs. 30,08,340 were direct and Rs. 21,012 indirect receipts. The net revenue realised after deducting working expenses amounted to Rs. 13,15,918. The gross revenue and the net revenue show a decrease of Rs. 2,68,411 and Rs. 1,82,359 respectively when compared with the figures of the previous year.

7. The gross area under command was 1,844,975 acres. The area irrigable at present is 622,800 acres.

8. The financial results of the year by main heads were as under :—

	Area irrigated	Revenue realised			Working expenses	Net revenue
		Direct receipts	Share of land revenue	Total		
	Acres	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	2,424	2,100	9,761	11,861	10,013	1,848
Unproductive	243,612	30,06,240	11,251	30,17,491	17,03,421	13,14,070
Total ..	*246,036	30,08,340	21,012	30,29,352	17,13,434	13,15,918

*Includes 8,648 acres under consolidated assessment.

Area irrigated, revenue etc.

9. The figures of area irrigated, revenue assessed and realised and working expenses as compared with those of the previous three years are given below :—

Year	Area irrigated*	Revenue		Working expenses
		Assessment	Realisations	
	Acres	Rs.	Rs.	Rs.
1926-27	272,164	35,61,623	30,34,339	15,30,460
1927-28	248,222	35,11,724	36,63,481	16,01,445
1928-29	231,544	31,59,294	32,97,763	17,99,486
Average ..	250,643	34,10,880	33,31,861	16,43,797
1929-30	246,036	31,63,392	30,29,352	17,13,434

*Includes the area under consolidated water and land assessment.

10. The state of the Revenue collections was as follows :—

		Rs.
Balance of demands unrealised at the commencement of the year		17,26,836
Demands of the year :—	Rs.	
Rabi, 1928-29 ..	6,49,075	
Kharif, 1929-30 ..	19,95,953	
Miscellaneous receipts ..	4,04,186	30,49,214
Total ..		47,76,050
Deduct—		
Remissions		54,489
Net Total ..		47,21,561
Amount unrealised at the close of the year ..		16,82,756

	Rs.	
Actual receipts of the year ..	30,38,805	
Add—		
Share of land revenue ..	21,012	
Deduct—	—	30,59,817
Refunds of revenue		30,465
Revenue realised		30,29,352

The remissions and refunds together amounted to Rs. 84,954. The amount unrealised at the close of the year amounted to Rs. 16,82,756 which is made up as follows :—

	Rs.
Hathmati and Khari Cut Canals	96,913
Ekruk Tank	24,066
Ashti Tank	25,315
Krishna Canal	68,187
Mhaswad Tank	10,483
Kadwa River Works	28,356
Girna Left Bank Canal	29,521
Godavari Canals	2,85,786
Pravara Canals	3,98,666
Mutha Canals including Matoba Tank ..	1,55,842
Nira Right Bank Canal	1,37,510
Nira Left Bank Canal and Shetphal Tank ..	3,32,909
Gokak Canal	50,131
Other Works	39,071
Total ..	16,82,756

A portion of this amount has already been recovered since the close of the year and steps have been taken to recover the balance.

Working expenses.

11. The working expenses of the year amounted to Rs. 17,13,434 against Rs. 17,99,486 of the previous year. The following table compares the charges under the principal heads with those of the previous three years :—

	1926-27	1927-28	1928-29	1929-30
	Rs.	Rs.	Rs.	Rs.
Works	66,376	65,471	34,267	36,036
Repairs	5,26,701	6,09,152	5,64,625	5,22,663
Establishment	8,30,794	10,25,925	10,76,789	10,72,593
Tools and plant	13,954	19,836	18,383	13,053
Total in the Public Works Department	14,37,825	17,20,384	16,94,064	16,44,345
Collection charges	86,706	—1,25,695	99,420	63,402
Indirect charges	5,929	6,756	6,002	5,687
Total working expenses ..	15,30,460	16,01,445	17,99,486	17,13,434

Details of working expenses.

12. The following table gives the details of working expenses for some of the principal works :—

Name of work	Average incidence of water rate per acre	Cost of measurement		Working expenses in the P. W. Department	
		Total cost	Per acre	Per mile of main canal	Per acre irrigated
	Rs.	Rs..	Rs. a. p.	Rs.	Rs.
Nira Left Bank Canal and Shetphal Tank.	12·49	2,243	0 0 7	2,802	4·16
Pravara Canals	13·83	1,100	0 0 6	3,524	7·63
Girna Left Bank Canal	11·02	306	0 1 3	3,193	15·16
Godavari Canals	16·14	786	0 0 7	2,780	13·56
Mutha Canals and Matoba Tank ..	16·37	1,243	0 1 4	1,454	8·84
Kadwa River Works	14	239	0 1 4	1,490	12·98
Mhaswad Tank	9·33	144	0 0 4	..	2·3
Nira Right Bank Canal	8·39	1,090	0 1 0	2,291	15·11
Krishna Canal	11·42	800	0 2 1	482	2·75
Yerla River Irrigation Works ..	4·21	1,050	0 2 8	652	3·41
Upper Man River Works.. ..	4·37	200	0 2 4	438	5·54
Jamda Canals	4·09	151	0 1 6	310	7·51
Ekruk Tank	7·33	105	0 0 4	367	3·49
Ashti Tank	5·67	73	0 0 3	293	1·71
Maini Tank	3·28	409	0 2 5	653	2·22
Gokak Canal	6·85	1,648	0 2 4	346	1·56
Dharma Canal	6·6	277	0 8 11	72	0·34

13. The gross assessed revenue, direct and indirect, amounted to Rs. 31,63,392 against Rs. 31,59,294 of the previous year. The details of the gross assessment are as under :—

Gross assessed revenue.

	Direct revenue			Indirect revenue	Total
	Water rates	Other receipts	Total		
	Rs.	Rs.	Rs.	Rs.	Rs.
Productive	3,638	14	3,652	9,761	13,413
Unproductive	27,34,556	4,04,172	31,38,728	11,251	31,49,979
Total ..	27,38,194	4,04,186	31,42,380	21,012	31,63,392

14. The net assessed revenue of the year after deducting working expenses (Rs. 17,13,434) amounted to Rs. 14,49,958 against Rs. 13,59,808 of the previous year.

15. The following table gives the percentage return earned during the year on capital outlay on some of the principal works in operation :—

Name of work	Total capital outlay (direct and indirect)	Gross receipts (direct and indirect)	Working expenses (direct and indirect)	Net revenue	Percentage return on capital outlay (column 2)
	Rs.	Rs.	Rs.	Rs.	Rs.
Hathmati and Khari Cut Canals.	13,18,729	45,008	42,191	2,817	0·21
Lower Panjhra River Works ..	4,68,621	24,190	6,679	17,511	3·73
Krishna Canal	9,49,807	58,717	18,715	40,002	4·21
Ekruk Tank	13,40,386	1,51,946	20,597	1,31,349	9·8
Ashti Tank	8,41,708	24,299	8,940	15,359	1 82
Maini Tank	4,96,330	9,726	6,218	3,508	0·7
Nira Left Bank Canal and Shetphal Tank.	1,28,02,462	8,14,907	3,16,107	4,98,800	3·9
Nira Right Bank Canal ..	3,85,56,534	1,29,621	2,51,556	—1,21,935	..
Kadwa River Works ..	10,35,876	45,757	38,198	7,559	0·73
Pravara River Works	1,50,07,048	4,75,098	3,07,791	1,67,307	1·11
Godavari Canals	1,03,25,861	5,21,046	3,47,909	1,73,137	1·68
Mutha Canals including Matoba Tank.	65,55,233	4,37,773	1,34,496	3,03,277	4·62
Chankapur Tank—Girna Left Bank Canal.	20,56,431	43,638	60,452	—16,814	..
Mhaswad Tank	20,96,016	53,198	17,309	35,889	1·71
Gokak Canal, 1st Section and Storage Works.	14,66,673	62,912	17,865	45,047	3·07

16. The average water rates per acre of land actually irrigated were :—

	Rs.
Productive works	5·91
Unproductive works.	11·22

17. The water rate assessments and other receipts compare with those of the previous year as under :—

	1928-29	1929-30
	Rs.	Rs.
Water rates	27,77,857	27,38,194
Other receipts—		
Plantations	16,571	16,705
Water power	14,313	14,313
Miscellaneous	3,29,405	3,73,168
Total ..	3,60,289	4,04,186
Share of land revenue	21,148	21,012
Grand Total ..	31,59,294	31,63,392

18. The principal crop acreages irrigated during 1928-29 and 1929-30 are given below :—

Crop acreages.

	1928-29 Acres	1929-30 Acres
Gardens and orchards	4,704	5,247
Sugarcane	39,421	31,314
Wheat	13,845	14,374
Rice	12,701	7,840
Maize	9,647	3,977
Jowar	57,113	68,231
Bajri, etc.	13,311	16,033
Gram, etc.	7,765	8,309
Groundnut	14,734	13,590
Condiments	4,916	4,831
Cotton	15,596	19,361
Fodder crops	2,360	5,360

The total estimated value of crops was Rs. 244·47 lakhs against Rs. 251·96 lakhs of the previous year. These estimated values are only approximate, as there is no uniform method of estimating them.

DETAILED REPORTS* BY LOCAL OFFICERS.

NORTHERN CIRCLE.

AHMEDABAD AND KAIRA AND PANCH MAHALS DIVISIONS.

19. The monsoon broke earlier than usual in the second week of June but lasted till the end of August only. Great difficulty was therefore experienced in giving water to crops for want of sufficient supply in the tanks and canals. The rainfall gauged at Ahmedabad and Prantij was 23·72 and 22·57 inches respectively against 30·30 and 29·20 inches, the average of the last 30 years. At Bareja, the central place of irrigation on the Khari Cut Canal, the rainfall was 19·01 inches and at Himatnagar, the head-works of the Hathmati Canal, the total rainfall during the year was 20·99 inches. The rainfall was thus insufficient and unfavourable for irrigation.

The irrigation works in operation in this Circle are (1) the Hathmati and Khari Cut Canals, (2) Wangroli Tank, (3) Tranza Nagrama Tanks, (4) Savli Tank, (5) Saiat Tank and (6) Futelao Tank.

HATHMATI AND KHARI CUT CANALS.

20. This system was the first and is still the most important canal system in Gujarat. The Hathmati Canal irrigates a tract of land lying between the Sabarmati and Khari rivers. When surplus water is available, part of its supply is passed into a reservoir known as the Bokh reservoir and part into the Khari. The Bokh reservoir gives no direct irrigation but acts as a storage work for the Khari into which it discharges.

* These reports have been framed on the basis of approximate figures obtained from the accounts for March with the exception of the report for the Southern Circle which has been prepared from final figures of the supplementary accounts.

Lower down on the Khari are two small irrigation systems which utilise the natural flow of the river and any excess water made available from the Hathmati Canal, part of the supply being abstracted for direct irrigation at the so-called " Khari sluices " and part diverted through an artificial cut, the Khari Cut, into a natural channel which in its turn supplies a system of distributaries, several small tanks and the large Chandola tank near Ahmedabad. This system was first opened in 1873-74 and more than Rs. 13 lakhs have been spent on it.

21. The Hathmati river was in flood for the first time on 22nd June, but the depth of flow over the weir was only 0·3 feet lasting for a few hours. There were 5 subsequent floods, 4 in July and 1 in August, but the greatest depth of water over the crest of the weir was only 2·4 feet on 28th July and the discharge 14,566 cusecs. This gave a fairly good flow in the canal which was supplemented by the last flood of 27th August, when the height of water over the weir was 1·5 feet. The area irrigated under the Hathmati Canal was 445 acres of rice in the kharif season and 408 acres in the rabi season. In the rabi season only one watering was given as the supply in the river fell away rapidly. The surplus water of the Hathmati was let down into the Bokh reservoir from 22nd June to 10th August and again from 24th August to 12th September. The total discharge as measured at the head of the Bokh feeder was 427·42 million cubic feet. This supply was made available for irrigation under the Khari Cut Canal from 15th September, the reservoir running empty on 15th November. The surplus water of the Hathmati Canal was also let into the Bhojwa channel from 28th July to 6th August and again from 27th August to 3rd October, the total flow delivered being 342·82 million cubic feet. The average daily discharge at the head of the Hathmati Canal was 58 cusecs. Deducting the surplus flow let into the Bokh reservoir and the Bhojwa channel, the net average daily discharge comes to 34 cusecs. The average daily discharge admitted into the canal at its head in the kharif season was 112 cusecs and that utilised for irrigation was 54 cusecs representing a duty of 4·52 acres. This low duty is due to lack of local showers and the great heat after August. In the rabi season the average daily discharge was 15 cusecs, representing a duty of 27 acres which is fair for a single watering.

22. The area irrigated under the Khari Cut Canal was 2,028 acres in the kharif season and 626 acres in the rabi season. The Khari river was in flood on 21st June, 29th June, 6th July and 12th July, but the floods were of very short duration. The maximum height of water over the weir at Raipur was 12·2 feet on 12th July, and as the water was not found to run to waste below the Khari sluices system, no water was admitted into the Khari Cut Canal during the monsoon. The Khari Cut Canal was fed from the surplus water of the Hathmati Canal through the Bhojwa channel from 1st to 8th August and from 30th August to the end of the kharif season, the supply in the canal being also supplemented from the Bokh reservoir according to requirements. As the late rains completely failed, the flow in the Khari river fell down and at the end of September the flow was diverted and taken through the Khari Cut Canal back into

the river lower down near Bidaj for protecting the transplanted area of the Kalambandhi villages, this diversion being done with a view to save large losses in transit in the sandy bed of the river. The average daily discharge at the head of the canal was 23 cusecs, of which 18 cusecs were used for irrigation on the canal and the rest delivered to the Khari sluices. In the kharif season the daily discharge was 51 cusecs of which 39 cusecs were used for irrigation, giving a duty of 52 acres which is fair, considering the unfavourable nature of the season. In the rabi season the average daily discharge was 5·39 cusecs and yielded a duty of 125 acres, which is usual.

23. The area irrigated, assessment, average water rate and working expenses on the Hathmati and Khari Cut Canals as compared with the average of the preceding three years are given below :—

	Kharif		Rabi		Total		Average water rate assessed per acre	Working expenses
	Area irrigated	Assessment	Area irrigated	Assessment	Area irrigated	Assessment		
	Acres	Rs.	Acres	Rs.	Acres	Rs.	Rs.	Rs.
Average	10,236	64,518	3,801	9,791	14,037	74,309	5·22	53,479
1929-30	2,540	11,103	1,034	2,411	3,574	13,514	3·78	42,191

The above figures clearly show that the year was a bad one for irrigation owing to deficient rainfall. Besides the usual himayat deductions of Rs. 698 which are recovered with the land revenue, remissions of Rs. 2,927 were granted during the year on account of the failure of crops owing to the scanty supply of irrigation water. The gross revenue realised from all sources amounted to Rs. 45,038 exceeding the working expenses by Rs. 2,847, which gives a return of 0·2 per cent. on the total capital outlay, exclusive of interest. If the interest charges for the year, amounting to Rs. 41,409, are taken into account the result is a loss of 2·9 per cent. on the capital cost of the Hathmati and Khari Cut Canals combined. A large sum of Rs. 96,920 remained unrealised at the end of March owing to the suspension of recovery of water rates due to bad seasonal conditions. The rainfall gauged at Himatnagar at the head of the Hathmati Canal was 20·07 inches in the kharif and 0·22 inch in the rabi season, and at Raipur at the head of the Khari Cut Canal it was 14·85 inches and " nil " respectively.

First Class Irrigation Tanks in Gujarat.

24. The five first class tanks mentioned below were constructed between the years 1904 and 1917 at an aggregate cost of Rs. 11 lakhs. They rarely yield any net return as there is not much demand on them in years of good rainfall, while in years of scarcity the tanks themselves hold deficient supplies. The Futelao tank is in the Panch Mahals Collectorate while the rest are in the Kaira Collectorate. The area irrigated,

assessment and the working expenses on the tanks during the year compare with the average of the previous three years as under :—

Name of tank	Year	Kharif		Rabi		Total		Working expenses
		Acres	Rs.	Acres	Rs.	Acres	Rs.	Rs.
Wangroli ..	Average ..	846	4,194	457	1,572	1,303	5,766	7,439
	1929-30 ..	1,686	8,131	129	475	1,815	8,606	7,158
Savli	Average ..	1,309	5,362	363	777	1,672	6,140	6,594
	1929-30 ..	1,665	6,814	..	..	1,665	6,814	2,082
Saiat	Average ..	144	499	282	1,069	426	1,568	8,287
	1929-30 ..	1,186	4,466	50	198	1,236	4,664	8,054
Tranza Nagrama ..	Average ..	67	257	38	104	105	361	3,010
	1929-30 ..	..	..	..	..	..	..	4,561
Futelao ..	Average ..	6	42	101	292	107	334	2,254
	1929-30 ..	22	176	9	28	31	204	1,368

The percentage returns from the working of these tanks during the year were as under :—

Name of tank	Gross assessment	Gross realisations	Working expenses	Net revenue	Capital outlay direct and indirect to end of 1929-30	Percentage return
	Rs.	Rs.	Rs.	Rs.	Rs.	
Wangroli.. ..	9,922	9,756	7,158	2,598	2,93,295	0·8
Savli	8,345	6,571	2,082	4,489	2,55,210	1·7
Saiat	5,763	4,991	8,054	—3,063	1,84,029	—1·6
Tranza Nagrama ..	1,446	1,562	4,561	—2,999	2,80,635	—1·06
Futelao	237	487	1,368	—881	1,16,461	—0·7

The tanks were maintained in good order at a cost of Rs. 16,120.

WANGROLI TANK.

25. The tank was partially filled and the water was utilised for irrigating hot weather, kharif and rabi crops, mainly sundhia, rice and gram. The surplus water of the last year was utilised for irrigating hot weather crops. The miscellaneous revenue realised from the tank amounted to Rs. 1,316 as compared with Rs. 878 of the previous year. The increase was due to more bed-cultivation. A remission of Rs. 4-11-0 was sanctioned during the year. The rainfall gauged at the site of the tank was 23·84 inches.

Savli Tank.

26. The tank was partially filled and the replenishment was utilised for irrigating kharif crops only, mainly rice. The demand for water in the kharif season was heavy, owing to the failure of rains at the end of the monsoon, and there was in consequence no water available for rabi irrigation. Hot weather crops, mainly sundhia, were irrigated from the surplus water of the previous year. The miscellaneous revenue realised amounted to Rs. 1,531 against Rs. 995 of the previous year. The increase was due to more land under cultivation in the tank-bed. The rainfall gauged at the site of the tank was 24·82 inches.

Saiat Tank.

27. The tank was partially filled and the storage was utilised for irrigating hot weather, Kharif and rabi crops, mainly sundhia, rice and gram. The miscellaneous revenue amounted to Rs. 1,099 against Rs. 820 of the previous year. The increase was due to more area under cultivation in the tank-bed. Remission of Rs. 21-10-0 was granted during the year. The rainfall gauged at the site of the tank was 29·65 inches.

Tranza Nagrama Tanks.

28. As the tanks were empty, there was no irrigation under them. The miscellaneous revenue realised amounted to Rs. 1,446 against Rs. 1,603 of the previous year. The small decrease in revenue was due to less tank-bed cultivation. The rainfall gauged at the Nagrama tank measured 18·18 inches and was about the same at the Tranza tank.

Futelao Tank.

29. The tank was partially filled. There was no kharif irrigation and the supply was utilised for irrigating rabi crops with some restriction on account of the previous arrears of irrigation revenue. The surplus water of the previous year was utilised for irrigating hot weather crops. The miscellaneous revenue realised amounted to Rs. 33 against Rs. 39 of the preceding year. The rainfall gauged at the site of the tank measured 16·25 inches.

IRRIGATION DEVELOPMENT AND RESEARCH CIRCLE.

30. Up to the end of the year 1927 the areas served by the rivers Nira, Godavari, Mutha, Pravara and Kadwa were grouped together under one Circle of Superintendence called the Deccan Irrigation Circle. The work in this Circle was for some time past much heavier than could be properly handled by one officer. Moreover, irrigation in the Deccan has reached a critical stage and its advance depends upon a satisfactory solution of the many difficult and complex problems which arise from time to time. In order to deal adequately with the scientific side of irrigational problems and practice, a new Circle of Superintendence called the Irrigation Development and Research Circle was accordingly created on 1st December 1927, and the Nira Left Bank Canal and Special Irrigation Divisions were placed under it. The work done by the latter Division is described under Section II of this Report.

NIRA LEFT BANK CANAL DIVISION.

NIRA LEFT BANK CANAL AND SHETPHAL TANK.

31. This canal which came into operation in 1885-86 is one of the pioneer irrigation works in the Deccan and protects a tract with a very precarious rainfall in Poona District. The original scheme consisted of (*a*) a ghat-fed storage tank at Bhatgar called Lake Whiting about 32 miles south of Poona on the Yelwandi river impounding 5,300 million cubic feet of water, (*b*) a pick-up weir at Vir on the Nira river about 17 miles downstream from Bhatgar, (*c*) a canal about 100 miles long, irrigating about 80,000 acres annually and (*d*) a tank at the tail of the canal with an effective capacity of 592 million cubic feet used for storing a portion of the surplus monsoon water. The masonry dam 127 feet high is now replaced by the higher Lloyd Dam referred to later on. The scheme is financially the most remunerative of the larger protective irrigation works now in operation in the Deccan.

32. The average of the rainfall at Bhatgar, at the several gauging stations along the canal and at Shetphal was 27·21 inches. The monsoon rainfall in the catchment area of Lake Whiting as also in the canal tract was above the average. The water in Shetphal tank reached its lowest depth of 26·3 feet on 3rd June, the contents being 255·9 million cubic feet. Replenishment from the canal was commenced on 4th June and the water in the tank reached the highest level of 36·55 feet on 2nd October, the corresponding contents being 555·62 million cubic feet. The following table gives the results of irrigation, revenue and rainfall during the year as compared with the average of the previous three years:—

Area irrigated		Irrigation assessment		Gross assessment		Rainfall	
1929-30	Average	1929-30	Average	1929-30	Average	1929-30	Average
Acres	Acres	Rs.	Rs.	Rs.	Rs.	Inches	Inches
71,965	73,093	8,98,709	10,01,386	9,08,312	10,12,095	24·56	21·08

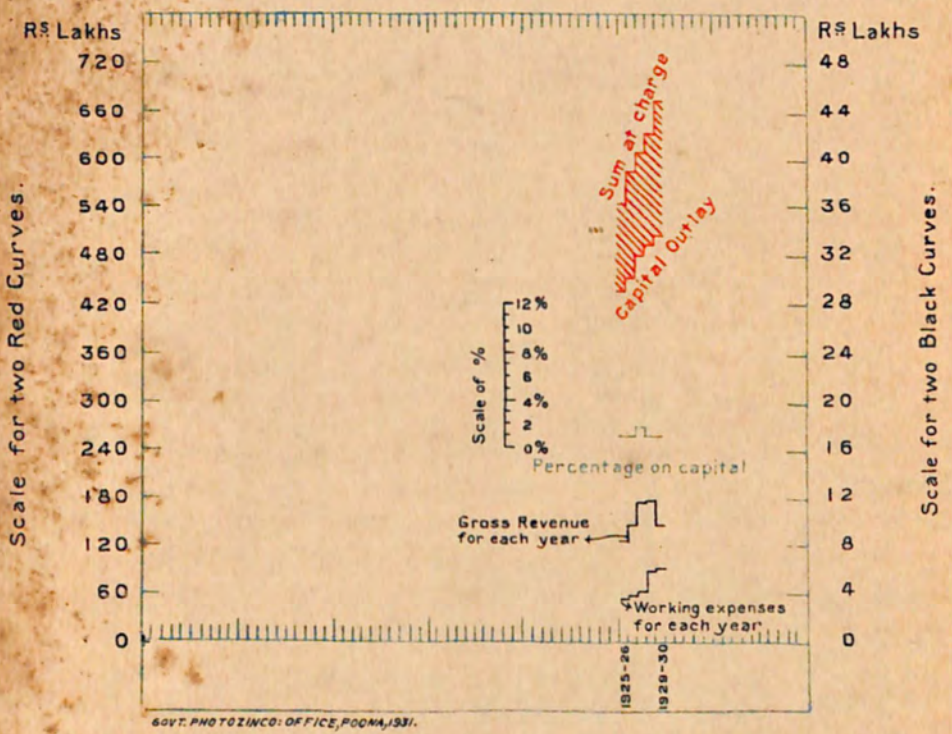
33. The area under sugarcane and other perennial crops together with the short-termed overlapped cane was 11,141 acres as compared with 11,968 acres of the preceding year. The decrease in the perennial area is due partly to the reduction of area under fruit trees and partly to the cancellation of perennial block area by the irrigators owing to unfavourable "Gul" market. The total area irrigated exceeds that of the last year by 3,966 acres, the increase being chiefly in area under the two-seasonal blocks. The area under perennial blocks during the year was 18,905 acres on the Nira Left Bank Canal and 1,714 acres on the Shetphal channel against 19,627 acres and 1,230 acres respectively of the preceding

year. The area of 8 months' blocks during the year was 24,256 acres on the Nira Left Bank Canal and 1,545 acres on the Shetphal tank against 20,455 acres and 1,852 acres respectively of the preceding year, showing a total increase of 3,494 acres. The increase in area under irrigation has not resulted in corresponding increase of the gross assessed revenue, but there was on the other hand a decrease of about Rs. 11,000 in revenue. This is due to (*a*) the fall in the cane area which yields much larger revenue than seasonal irrigation, (*b*) the strict restriction of the period of overlap to 4 months whereas in previous years the overlap extended up to 8 months and (*c*) the reduced demand for water for early sowing of rabi crops as a result of timely rains. The average water rate assessment per acre of land irrigated was Rs. 12·49 against Rs. 13·38 of the previous year. The fall is due to less area under cane. The total estimated value of crops raised was Rs. 91·31 lakhs against Rs. 103·29 lakhs of the previous year. The decrease is due to less irrigation of cane and also to the lower value of crops than the previous year. The refunds of revenue granted during the year and remissions sanctioned amounted to Rs. 19 and Rs. 52 respectively. The cost of establishment for measuring 61,534 acres amounted to 7 pies per acre as compared with 9 pies of the preceding year.

Nira Valley Development Project.

34. This project provides for complete development of irrigation in the Nira valley and involves an expenditure of Rs. 135·8 lakhs on (*a*) the widening and remodelling of the Nira Left Bank Canal—Rs. 36·7 lakhs and (*b*) construction of a new dam at Vir—Rs. 99·1 lakhs. The storage of 24,000 million cubic feet impounded by the Lloyd Dam at Bhatgar, referred to later on, will provide sufficient water for the existing irrigation on the old Nira Left Bank Canal and 132,000 acres of new irrigation on the Right Bank Canal. A considerable period will, however, be necessary for the proper development of irrigation on the new Right Bank Canal. Pending this development, water can be utilised in the Left Bank Canal area without delay, as irrigation has been long established there and there is keen demand for additional water. The remodelling of the Nira Left Bank Canal at a cost of Rs. 36·7 lakhs is therefore a remunerative proposition in itself, as it enables the Canal to irrigate an additional area of 19,000 acres. The remodelling was started in 1925-26. When it is found that the demand for water on the new Right Bank Canal necessitates it, the construction of the proposed new dam at Vir will be considered in order to provide timely replacement of the supply taken away from the Lloyd Dam for the extended irrigation on the Left Bank Canal. The Vir dam will impound 8,800 million cubic feet of water and will enable the irrigation on both the canals to be methodically developed. The Nira Valley Development Project as a whole including the Lloyd and the Vir Dams and the Left and the Right Bank Canals will store about 33,000 million cubic feet of water and will command an area of 834,000 acres, of which approximately 238,000 acres will be irrigated annually including 80,000 acres of existing irrigation on the Left Bank Canal.

FINANCIAL RECORD
FOR
Nira Right & Left Bank Canals.
1925-1930

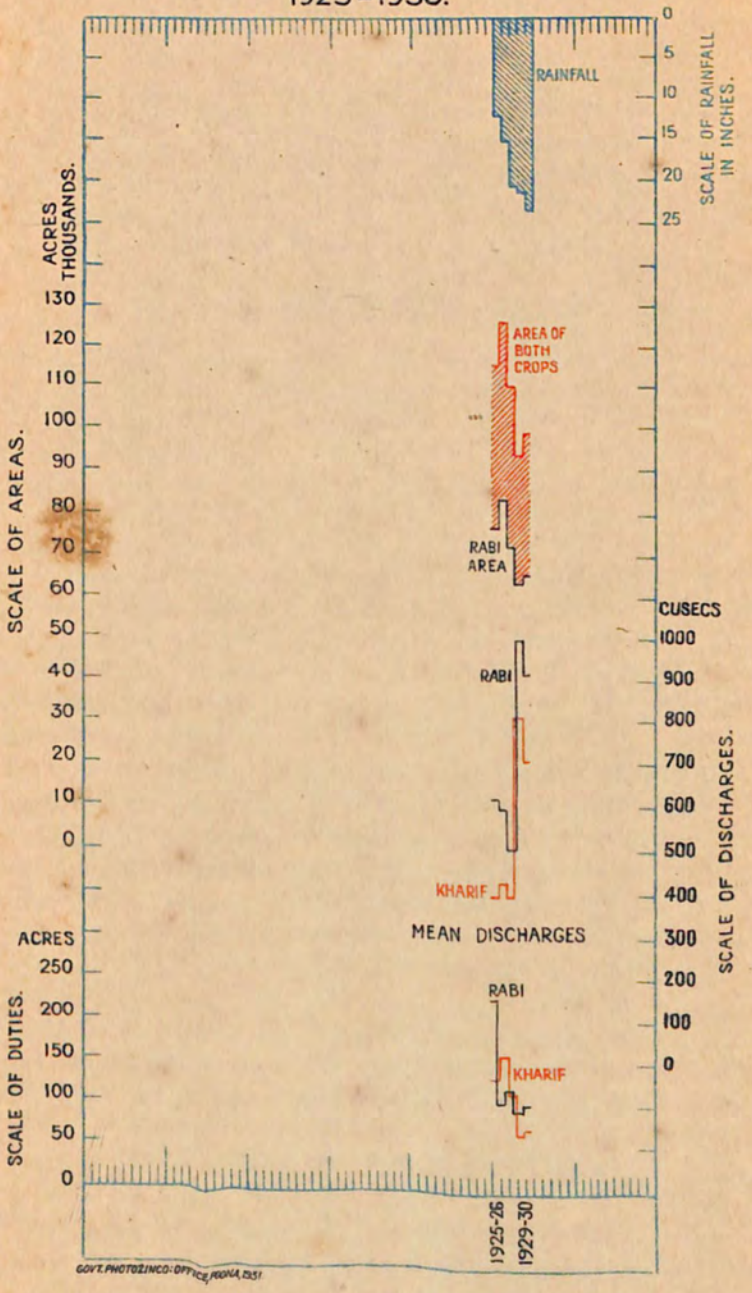


Ag: Superintending Engineer,
Deccan Irrigation.

12/1/31

Executive Engineer,
Malsiras Division.

WORKING RECORD
FOR
NIRA RIGHT & LEFT BANK CANALS
1925-1930.



V. N. Mantes
Ag:- Superintending Engineer,
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12/1/31
Executive Engineer,
Malsiras Division.

·35. The designed discharge of the Nira Left Bank Canal at head as originally constructed was 456 cusecs and at tail 91 cusecs. The remodelling of the canal, which when completed will provide for a discharge of 721 cusecs being carried, made considerable progress during the year. The construction of a 12-foot service road along the whole length of the canal was completed. The remodelling of distributaries was also undertaken but much of the work consisted of surveying and preparing plans and estimates for their remodelling. Standing wave flumes were constructed at most of the distributary heads. The total expenditure incurred on this remodelling work to the end of March 1930 amounted to Rs. 14,53,363 against the sanctioned estimate of Rs. 40,43,476. The total expenditure during the year amounted to Rs. 3,23,505.

DECCAN IRRIGATION CIRCLE.

36. The main feature of the season was that there were no anti-monsoon showers. In June the rainfall was spasmodic in Ahmednagar and Sholapur Districts. The regular monsoon broke late in the first week of July and was inadequate. From the last week of July till about the 15th of September there was complete drought all over the canal tracts. In the second fortnight of September nearly 40 to 50 per cent. of the average annual rainfall was received all over the Deccan. This fall was very intense. There was not much rain after October and so the winter was practically dry. The winter temperature was not regular; there was an abrupt heavy fall in humidity in January which was exceptionally bad for the rabi jowar. In the first half of February the temperature again fell but the duration being short the crops did not suffer much. On the whole, the season was unfavourable both to kharif and rabi crops.

37. The most paying crop in the Deccan is sugarcane and it is only by growing a considerable amount of cane in suitable areas that Deccan Canals can be made productive, apart from their protective character. The slump in the price of sugarcane products and the increase in working costs of the cane industry have made any extensive cultivation of sugarcane impossible. Cane-growers derived benefit during the year under report from the good yield of the crop and the fairly good rates obtained for Gul.

38. The total area irrigated in this Circle during the year was 109,711 acres against 101,495 acres of the previous year and the gross revenue amounted to Rs. 16·37 lakhs against Rs. 17·25 lakhs of the last year.

LAKE WHITING AND MALSIRAS DIVISIONS.

Lloyd Dam and Nira Right Bank Canal.

39. The Nira Right Bank Canal is the largest canal in the Deccan. The original estimate of the project framed in 1910 provided for (*i*) raising the dam at Bhatgar by 60 feet so as to increase its storage capacity from 5,300 million cubic feet to 24,000 million cubic feet, (*ii*) a canal 109 miles long on the right bank of the Nira river having a capacity at head of 1,500

cusecs and (*iii*) widening the existing Nira Left Bank Canal so as to increase its discharge from 450 to 760 cusecs. The capital cost was estimated at about Rs. 258 lakhs and the area to be irrigated annually at 190,000 acres. The project was submitted to the Government of India in May 1911, sanctioned by the Secretary of State in June 1912 and the work was started in the same year. Before taking in hand the work of raising the Bhatgar Dam a thorough investigation was made into its design and estimates with the result that it was decided on technical grounds to abandon the project proposal for raising the dam and to construct an entirely separate structure. Owing to this change and to the unprecedented rise in the cost of labour and materials which took place from about the year 1916 in consequence of the Great War, a revised estimate was framed in 1920 for Rs. 491 lakhs and submitted to the Government of India in September 1921. The revised project provided for (*i*) a new dam at Bhatgar to increase the storage from 5,300 million cubic feet to 24,000 million cubic feet, (*ii*) a canal on the right bank of the Nira river, 109 miles long and (*iii*) the expenditure of Rs. 3¾ lakhs already incurred on widening the Nira Left Bank Canal. It was anticipated that 132,000 acres would be irrigated annually and the gross revenue would amount to Rs. 15,22,000 and the net revenue to Rs. 11,92,000 giving a return of 2·4 per cent. on the capital outlay. The revised project was sanctioned by the Secretary of State in June 1922.

40. The Lloyd Dam at Bhatgar, 190 feet high, 5,300 feet long and 124 feet wide at the base, was completed in 1928 at a cost of Rs. 172 lakhs. It is one of the largest in the world and contains 21½ million cubic feet of masonry. It supplies water both to the old Nira Left Bank Canal and the new Right Bank Canal. The lake formed by the dam has a length of 17 miles at full supply level and a storage capacity of 24,000 million cubic feet of water. The catchment area is 128 square miles and the rainfall in the catchment varies from 250 inches in the Ghats to 40 inches at Bhatgar. In addition to the sluices for letting out water for irrigation there are 81 waste weir gates, 10′ × 8′ (45 being automatic and 36 rolling) which control and regulate the flood level in the lake.

41. Practically all deep cutting and high banks of the Nira Right Bank Canal have been completed and all the masonry works down to the end of the canal have also been completed. The progress on branches and distributaries is equally satisfactory. The acceleration of progress in recent years made it possible to issue water from the canal for rabi crops during the year 1924-25. The canal commands lands in Satara and Sholapur Districts and in Phaltan State and ends near Mohod in Sholapur District, the total length being about 106½ miles. The culturable area commanded by the scheme is 448,000 acres, out of which 132,000 acres will be irrigated annually when the canal is fully developed. The designed discharges of the canal at head and tail are 1,500 and 414 cusecs respectively, the corresponding full supply depths being 8 and 6·5 feet. The distribution system is being constructed on up-to-date principles and the latest types of measuring devices are being provided at the distributary heads and also at frequent intervals on the channels. Improved types of

outlets and falls have been introduced, and care has been taken to maintain correct discharging capacity and efficiency of all parts of the distribution system. The whole perennial area under the canal has been carefully surveyed and soil classification carried out before designing channels, while areas unsuitable for perennial crops have been determined and indicated on the maps.

42. Against the total project estimate of Rs. 491 lakhs, the expenditure incurred up to the end of the year under report was as under :—

	Expenditure during the year	Total expenditure up-to-date
	Rs.	Rs.
Lloyd Dam	28,020	1,19,14,693
Nira Right Bank Canal	6,88,373	1,74,69,372
Establishment and pensionary charges ..	4,26,669	72,70,738
Tools and plant	12,155	9,81,915
Suspense account	....	58,964
Less receipts on capital account ..	25,652	1,90,717
Total ..	11,29,565	3,75,04,965

The expenditure incurred on maintenance and repairs during the year amounted to Rs. 91,515 and the outlay on extensions and improvements to Rs. 1,639.

43. On 1st April, the level of water in Lake Whiting was 117·82 feet above the sill of the canal sluices, the corresponding contents being 15,027·41 million cubic feet. The lowest level of 108·25 feet was reached on 9th June, the contents being 12,038.42 million cubic feet. The monsoon then commenced and strengthened in the catchments of the Yelwandi and Nira rivers from 23rd June. The lake filled rapidly and the draw-off for irrigation commenced on 20th October, when the lake was at its full supply level of 143 feet, the corresponding contents being 24,197·9 million cubic feet. On 31st March, the level was 115·9 feet on the gauge, the contents being 14,415·36 million cubic feet. The run-off from the catchment of the lake (128 square miles) amounted to 35,321 million cubic feet, the average of the several rain-gauge readings in the catchment area being 156·4 inches. The rainfall in the canal tract averaged 22·31 inches. It was not timely for kharif crops but was fairly good for other seasonal crops.

44. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated		Irrigation assessment		Gross assessment	
1929–30	Average	1929–30	Average	1929–30	Average
Acres 16,146	Acres 19,257	Rs. 1,35,517	Rs. 1,46,042	Rs. 1,39,341	Rs. 1,48,173

Working expenses		Realisations		Rainfall	
1929–30	Average	1929–30	Average	1929–30	Average
Rs. 2,51,556	Rs. 1,57,700	Rs. 1,29,621	Rs. 1,00,075	Inches 22·31	Inches 15·88

The decrease in the area irrigated and assessment was due to timely rainfall which caused less demand for canal water for kharif and rabi crops. The development of irrigation on this canal is not progressing satisfactorily owing to the bad economic condition of the cultivators and the slump in the Gul market. The area under sugarcane during the year was only 64 acres and the area of two-seasonal or rabi leases under the canal was 11,550 acres. The cost of measuring establishment amounted to Rs. 1,090, which gives a rate of 1 anna and 1 pie per acre against 1 anna and 3 pies in the previous year.

Mhaswad Tank.

45. This irrigation tank is formed by an earthen dam across the Man river 9,000 feet long and 80 feet high at its highest point. It has a storage capacity of 2,602 million cubic feet and irrigates lands in Sholapur District. Though the capacity is considerable, the supply is not reliable owing to the precarious nature of the rainfall in its catchment. The designed discharges of the two Mhaswad canals at head are 180·7 and 176·93 cusecs with the full supply depth of 4 feet, and the tail discharges are 180 and 125·76 cusecs with the depths of 3 and 4 feet respectively. It is intended to utilise the discharge available from these canals to supplement the discharge at the tail of the Nira Right Bank Canal (Branch No. 3) when it is ready to take it. The Mhaswad canal system will then cease to appear as a separate entity and will be merged into the Nira Right Bank Canal system.

46. On 1st April, the level of water in the tank was 17·7 feet above the sill, the corresponding contents being 1,614·01 million cubic feet. Before the commencement of the rabi season, the water level rose to its full height of 24 feet above the sill of the outlet, the contents being 2,601·17 million cubic feet, and the waste weir overflowed on 17th September.

This made it possible to meet fully the demands of the rabi season. On 31st March, the level was 15·95 feet, the contents being 1,378·75 million cubic feet. There were good rains in September and October which partially helped the crops in both the kharif and rabi seasons. The average of the several rain-gauge readings in the catchment (480 square miles) was 21·61 inches and the run-off amounted to 20,565 million cubic feet. The average rainfall in the canal tract was 20·55 inches.

47. The following table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated		Irrigation assessment		Gross assessment	
1929-30	Average	1929-30	Average	1929-30	Average
Acres 6,926	Acres 5,977	Rs. 64,532	Rs. 41,988	Rs. 70,863	Rs. 56,010

Working expenses		Realisations		Rainfall	
1929-30	Average	1929-30	Average	1929-30	Average
Rs. 17,309	Rs. 18,392	Rs. 53,198	Rs. 51,586	Inches 20·55	Inches 21·77

The increase in the area irrigated and the consequent increase in assessment was due to the supply in the tank being available for irrigation throughout the year. The refunds of revenue sanctioned amounted to Rs. 1,622-8-0. A refund of Rs. 663-8-0 was sanctioned for the lands leased out for cultivation in the tank basin and a remission of Rs. 15,430 was also granted, as the lands were not available for cultivation during the year under report. The cost of measuring establishment was 4 pies per acre against 3 pies in the previous year.

MUTHA CANALS DIVISION.

Mutha Canals including Matoba Tank.

48. This system came into operation in 1874-75. The canals were constructed at a cost of about Rs. 65½ lakhs with a large Ghat-fed storage reservoir called Lake Fife on the Mutha river at Khadakwasla about 12 miles from Poona. The dam is of masonry 107 feet high and spans the valley of the Mutha river and the lake has a very reliable catchment. The water of the lake is used for supplying drinking water to Poona and for irrigation. The system comprises two canals, the Right and the Left Bank, 70 and 18 miles long respectively. The maximum designed discharges of the two canals are 412 and 38·5 cusecs respectively. The Matoba tank is a tail tank receiving its supply from the Right Bank Canal during the monsoon months. The Mutha Canals, particularly the Right

Bank Canal, play a very important part in the welfare of Poona city and the surrounding country. They supply the Cantonment and the City with drinking water and have, besides irrigating ordinary crops, fostered the cultivation of fruit, vegetables, fodder, and sugarcane within easy reach of this large city and important Military station. The supply in Lake Fife is however insufficient to meet the increasing demands on account of the water supply to Poona and cultivation on the two canals. A project for increasing the storage of the canals either by building a new dam or by raising the existing dam and for remodelling and extending the Right Bank Canal is under preparation.

49. On 1st April, the level of water in Lake Fife was 18·2 feet above the sill of canal sluices, the corresponding contents being 1,667·82 million cubic feet. The lowest level of 9 feet was reached on 10th June, the contents being 683·83 million cubic feet. Thereafter replenishment commenced and the maximum flood occurred on 5th July when the lake overflowed, the level of water then being 34 feet and the contents 3,643 million cubic feet. The draw-off for irrigation from the storage commenced on 24th October. On 31st March, the level was 18·15 feet, the contents being 1,661·67 million cubic feet. The average of the readings of the several rain gauges in the catchment of the lake (196 square miles) was 99·91 inches and the run-off amounted to 33,067 million cubic feet. The rainfall in the canal tract was 21·06 inches. The monsoon which started late was not favourable and the rabi rains failed entirely. The Matoba tank dried up on 9th April and remained empty till 15th June when it received replenishment due to local rainfall. It again dried up on 4th August. Regular replenishment from the Mutha Right Bank Canal commenced from 8th August and the tank reached its full supply level of 29 feet on 18th September, the contents being 216·55 million cubic feet. It ran dry on 12th March.

50. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated		Irrigation assessment		Gross assessment	
1929–30	Average	1929–30	Average	1929–30	Average
Acres 14,478	Acres 15,719	Rs. 2,37,073	Rs. 2,54,096	Rs. 3,79,846	Rs. 3,79,360

Working expenses		Realisations		Rainfall	
1929–30	Average	1929–30	Average	1929–30	Average
Rs. 1,34,496	Rs. 1,43,367	Rs. 4,37,773	Rs. 3,73,608	Inches 21·06	Inches 19·06

An area of 29 acres was indirectly irrigated by underground percolation from the Mutha Left Bank Canal and the revenue derived therefrom was Rs. 73. The perennial section of the Right Bank Canal is up to 23⅝ mile, while the whole length of the Left Bank Canal is perennial. The areas of the two seasonal leases under the two canals and the Matoba tank during the year were 18,114 and 1,317 acres respectively. The refunds of revenue sanctioned amounted to Rs. 226. The cost of measuring establishment amounted to Rs. 1,243, which gives a rate of 1 anna and 4 pies per acre, the same as in the previous year. The quantity of water supplied during the year to the Poona Cantonment was 849 million gallons and to the Poona City Municipality 2,228½ million gallons, the corresponding revenue being Rs. 39,100 and Rs. 79,904 as compared with Rs. 32,892 and Rs. 70,369 of the preceding year. The expenditure incurred on extensions and improvements and maintenance and repairs during the year amounted to Rs. 6,250 and Rs. 40,197 respectively.

Kasurdi Tank.

51. This tank which had remained empty since 2nd January received replenishment on 16th June and again dried up on 10th August. It received another replenishment on 17th September and overflowed on the same date, the overflow lasting till 7th November. Water was issued for irrigation of rabi crops and the tank finally went dry on 18th December.

Shirsuphal Tank.

52. This tank, which had not dried up, received its first replenishment on 25th June. It received further replenishment on 19th September and reached its full supply level of 31 feet on 3rd October, the contents being 356·64 million cubic feet. It overflowed on the same date, the overflow lasting till 10th November. Water was issued for irrigation of rabi and two-seasonal crops. On 31st March, the level of water in the tank was 25·48 feet, the contents being 193·1 million cubic feet. The area of two-seasonal leases sanctioned under the tank was 701 acres.

Bhadalwadi Tank.

53. This tank stood at a level of 33·23 feet on 1st April, the contents being 165·7 million cubic feet. It received replenishment on 18th June and filled to overflowing on 27th September. The contents of the tank amounted to 190·74 million cubic feet, the depth of water being 35 feet. The draw-off for irrigation commenced on 2nd November. On 31st March, the level of water was 25·43 feet above the sill of the outlet, the contents being 74·54 million cubic feet. The area of two-seasonal leases sanctioned under the tank was 1,281 acres.

54. The sub-joined table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Name of tank	Area irrigated		Irrigation assessment		Gross assessment	
	1929–30	Average	1929–30	Average	1929–30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Kasurdi	129	33	629	115	1,517	1,952
Shirsuphal	1,326	691	7,074	4,118	7,582	5,252
Bhadalwadi ..	1,390	847	7,055	5,343	7,596	5,622

Name of tank	Working expenses		Realisations		Rainfall	
	1929–30	Average	1929–30	Average	1929–30	Average
	Rs.	Rs.	Rs.	Rs.	Inches	Inches
Kasurdi	1,175	1,222	1,201	1,904	24·20	17·26
Shirsuphal	6,237	14,088	5,082	5,293	21·79	17·75
Bhadalwadi ..	4,062	4,253	1,180	6,262	27·31	18·62

The increase in the area irrigated and the consequent increase in irrigation assessment was due partly to the increased demand for tank water and sufficiency of supply in the tanks, and in the case of Shirsuphal and Bhadalwadi tanks it was also due to the irrigators having taken up two-seasonal leases which they had cancelled in the previous year. The decrease in the gross assessed revenue in the case of Kasurdi tank was due to less receipts from canal produce. The increase in gross revenue in the case of the other two tanks was partly due to increase in the area irrigated and partly to increased demand for canal produce. The tanks were maintained and repaired at a cost of Rs. 4,102. The refunds of revenue sanctioned in the case of Bhadalwadi tank amounted to Rs. 275.

PRAVARA CANALS DIVISION.

Godavari Canals.

55. This is one of the important major irrigation works undertaken in the Deccan for the protection of areas liable to famine. It was started in 1907 and completed in 1915-16 at a cost of about one crore of rupees. The system comprises (1) a storage reservoir called Lake Beale on the Darna river, a tributary of the Godavari, about 20 miles distant from Nasik,

(2) a pick-up weir at Nandur Madhmeshwar on the Godavari, 47 miles below the Darna Dam, which impounds the water let down from the Dam for distribution to the Canals and (3) two canals, the Right Bank Canal, 69 miles long, which serves the northern tracts of Ahmednagar District, and the Left Bank Canal, 48 miles long, which irrigates lands north of the Godavari valley in Nasik and Ahmednagar districts. The Darna Dam inclusive of its waste weir is a little over one mile long and has a maximum height of 92 feet above its lowest foundations. The lake has a storage capacity of 8,818 million cubic feet. The cost of the dam was Rs. 34·27 lakhs. The weir at Nandur Madhmeshwar is a work of considerable magnitude, its length being 3,618 feet, inclusive of the Right and Left Bank Canal regulators, situated at either end of the weir. It has a maximum height of 34 feet above the river bed. Scouring sluices have been constructed close to the head regulators of the two canals with the object of keeping the approach channels to them clear of silt. The total area under command of the canals is 232,390 acres, of which some 80,000 acres are irrigable annually. The two canals (Right and Left Bank) are designed to discharge 384 and 228 cusecs at head, with full supply depths of 7 and 6 feet respectively, and the tail discharges are 114·41 and 35 cusecs with full supply depths of 5 and 3 feet respectively. Irrigation on these canals has developed so rapidly as to render the provision of additional storage works a problem for consideration in the near future. An additional storage of 7,000 million cubic feet is considered necessary to develop fully the Godavari area and a scheme for a new storage at Gangapur on the Godavari river near Nasik is under investigation.

56. On 1st April, the level of water in Lake Beale was 51·7 feet above the sill of the sluices which is at R.L. 1810, the corresponding contents being 4,018·85 million cubic feet. The lowest level was reached on 6th June, when it was 40·7 feet above the sill, the contents being 2,212·03 million cubic feet. The lake received its first replenishment on 9th June and the level rose to the crest of the waste weir gates (55·9 feet above the sill of the outlet sluices) on 11th July, the contents being 5, 015·2 million cubic feet. The highest level reached was 64·7 feet on 27th October, the corresponding contents being 7,659·47 million cubic feet, against the full supply level of 65 feet. This level was maintained till 26th November, when the draw-off for irrigation commenced and the level gradually fell to 49 feet on the gauge on 31st March, the contents then being 3,451·91 million cubic feet. The yield from the catchment of the lake (156 square miles) was 21,006 million cubic feet, the average of the several rain gauge readings being 60·82 inches. The rainfall in the canal tract was 16·51 inches on the Right Bank Canal and 14·27 inches on the Left Bank Canal. The rainfall both in the catchment of the lake and along the canal tracts was generally below the normal. It was short during the months of July and August at the time when monsoon crops are most in need of water, and it almost entirely failed in the rabi season.

57. The following table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

	Area irrigated		Irrigation assessment		Gross assessment	
	1929-30	Average.	1929-30	Average	1929-30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Lake Beale	423	425	1,558	1,676	4,00,023	5,30,381
Godavari Right Bank Canal.	14,079	16,240	2,27,268	3,00,631		
Godavari Left Bank Canal.	9,494	10,005	1,58,929	1,93,469		

	Working expenses		Realisations		Rainfall	
	1929-30	Average	1929-30	Average	1929-30	Average
	Rs.	Rs.	Rs.	Rs.	Inches	Inches
Lake Beale	3,47,467	3,18,573	5,21,046	5,67,695	..	..
Godavari Right Bank Canal.					16·51	19·55
Godavari Left Bank Canal.					14·27	20·67

The perennial limit of the Right Bank Canal extends up to mile 60. The areas of perennial blocks and two-seasonal leases sanctioned under this canal during the year under report were 7,223 and 1,643 acres respectively. The perennial section of the Left Bank Canal extends up to mile 42. The areas of perennial blocks and two-seasonal leases sanctioned thereunder during the year were 5,683 and 1,540 acres respectively. The decrease in the area irrigated and the consequent decrease in assessment on the whole Godavari system was due to less perennial irrigation during the year under report. About 2,400 acres of blocks were cancelled by the irrigators during the year on both the canals partly due to the slump in the sugarcane industry and partly to damage by frost. The cost of measuring establishment amounted to Rs. 786 which works out to 7 pies per acre as compared with 8 pies of the previous year. The unitisation of areas into 20-guntha plots is being strictly enforced on this system and the cost of measurement will be reduced still further after the whole area has been unitised. The refunds of revenue amounted to Rs. 16,486 and remissions to Rs. 405. The large amount of refunds was due to the damage caused by frost in January 1929. The expenditure during the year on maintenance and repairs to the canals amounted to Rs. 75,410, and the expenditure incurred on Lake Beale was Rs. 7,074. The telegraph and telephone lines along the canals were maintained at a cost of Rs. 5,100.

Pravara River Works.

58. This system which was constructed at a cost of Rs. 1½ crores comprises (1) the Wilson Dam at Bhandardara, on the Pravara river, which is one of the highest dams in the world, (2) the pick-up weir on the river at Ojhar 53 miles below the dam and (3) two canals, 33 and 48 miles long respectively, which take off at the weir. The canals irrigate lands in Ahmednagar District and command an area of 228,720 acres of which 57,000 acres will be irrigated annually when the canals are fully developed. The designed discharges of the two canals (Pravara Right and Left Bank) at head are 152·62 and 530 cusecs respectively, the corresponding full supply depths being 5 and 8 feet, and the designed discharges at tail are 81·79 and 102 cusecs respectively, with a full supply depth of 3 feet. The first few miles of both the canals have become heavily silted and weed-infested due to insufficient bed-slope and proposals to remodel these sections are under consideration. The Wilson Dam which forms Lake Arthur Hill was commenced in 1911 and completed in 1926. The catchment area of the lake is 47 square miles situated in the Ghats with assured run-off. The dam which is designed to impound 270 feet depth of water as a maximum is about 1,600 feet long at crest and is constructed across a gorge in the Pravara river valley. At present water to a depth of 260 feet is impounded, giving a storage of 10,086 million cubic feet, which can be increased to 12,092 million cubic feet with a depth of 270 feet by erecting automatic gates on the waste weir. The pick-up weir at Ojhar is 890 feet in length. Silt has accumulated in the weir basin to such an extent that it cannot hold even a full day's supply for the canals. The undertaking of necessary remedial measures is under contemplation. The existing storage at Bhandardara is also not sufficient for the full projected development of the canals and a supplementary storage will be necessary at some future date. In order, however, to ameliorate the defective conditions at Ojhar weir as a temporary remedial measure a stone-in-mud wall 3 feet high is built up over the weir every year in the cold season so as to increase the storage, and give the required irrigating level.

59. On 1st April, the level of water in Lake Arthur Hill was 227·8 feet above the sill of the outlet, the corresponding contents being 5,550·17 million cubic feet. The lowest level of 206·2 feet was reached on 12th June, the contents being 3,609·91 million cubic feet. Replenishment commenced from 13th July and was slow. The full supply level of 260 feet was reached on 31st July. The highest level reached during the year was 262·8 feet on 26th August, the contents being 10,614·81 million cubic feet. The full supply level was maintained till 13th October, when the draw-off for irrigation commenced. The level gradually fell to 218·85 feet on 31st March, the contents being 4,655·81 million cubic feet. The yield from the catchment of the lake was 25,788 million cubic feet, the average of the several rain-gauge readings being 116·46 inches. The rainfall in the canal tract was 11·31 inches on the Pravara Right Bank Canal and 14·81 inches on the Pravara Left Bank Canal. The rainfall both in the catchment and over the canal tracts was much below the normal.

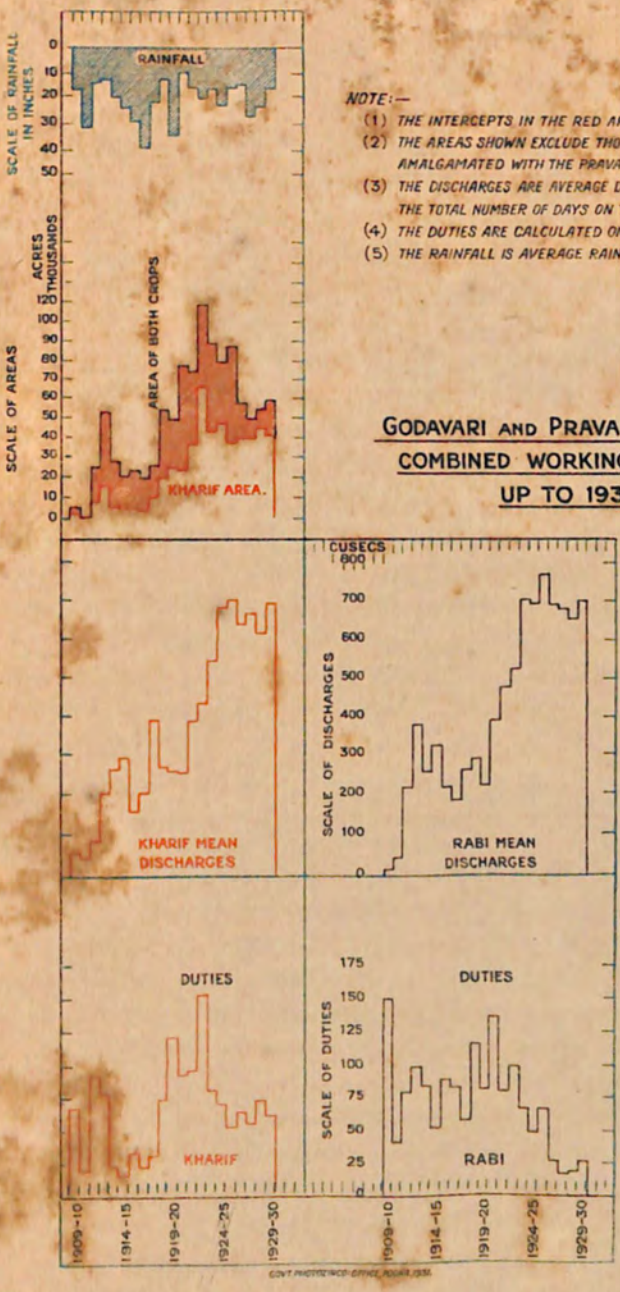
It was defective during July and August, when the kharif crops are most in need of water, and almost entirely failed in the rabi season.

60. The following table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Name of canal	Area irrigated		Irrigation assessment		Gross assessment	
	1929–30	Average	1929–30	Average	1929–30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Pravara Right Bank Canal.	11,022	8,564	1,25,722	1,55,458	5,17,070	6,28,457
Pravara Left Bank Canal.	26,008	20,753	3,86,306	4,59,893		

Name of canal	Working expenses		Realisations		Rainfall	
	1929–30	Average	1929–30	Average	1929–30	Average
	Rs.	Rs.	Rs.	Rs.	Inches	Inches
Pravara Right Bank Canal.	3,07,791	3,22,429	4,75,098	6,56,379	11·31	21·28
Pravara Left Bank Canal.					14·40	22·13

The whole length of the Right Bank Canal is perennial, while the perennial limit of the Left Bank Canal is at mile 38½. The areas of perennial blocks and two-seasonal leases sanctioned on the two canals during the year under report were 9,588 and 10,266 acres respectively. Although the area irrigated during the year was in excess of the average of the past three years, the increase was in seasonal irrigation only. There was keen demand for canal water for seasonal crops on account of the defective rainfall in July and August, when the kharif crops are in need of water, and also on account of the failure of rabi rains. On the other hand, irrigation revenue decreased owing to decrease in perennial irrigation, which was partly due to the slump in the sugarcane industry and partly to the damage caused by frost. The area of blocks cancelled during the year was about 2,000 acres. The cost of measuring establishment amounted to Rs. 1,100, which works out to 6 pies per acre the same as in the previous year. The refunds of revenue sanctioned amounted to Rs. 9,906. The large amount of refunds was due to the damage caused by frost in January 1929. The expenditure during the year on maintenance and repairs to the canals amounted to Rs. 69,465. In addition certain extensions and improvements were carried out at a cost of Rs. 1,287 and the telegraph and telephone lines along the canals were maintained at a cost of Rs. 6,915. The total outlay on repairs and maintenance of the Wilson Dam during the year amounted to Rs. 8,050.



NOTE:—

(1) THE INTERCEPTS IN THE RED AREA SHOW THE RABI ACRES EACH YEAR.
(2) THE AREAS SHOWN EXCLUDE THOSE OF THE LAKH CANAL TILL IT WAS AMALGAMATED WITH THE PRAVARA LEFT BANK CANAL IN 1925-26.
(3) THE DISCHARGES ARE AVERAGE DISCHARGES AT HEAD CALCULATED ON THE TOTAL NUMBER OF DAYS ON THE SEASON CONCERNED.
(4) THE DUTIES ARE CALCULATED ON THE ABOVE AREAS AND DISCHARGES.
(5) THE RAINFALL IS AVERAGE RAINFALL OF ALL THE STATIONS ON THE CANALS.

GODAVARI AND PRAVARA CANALS COMBINED WORKING RECORD UP TO 1930.

NOTE:—

GRAPHS FOR (1) DUTIES & (2) MEAN DISCHARGES ARE PLOTTED SEPARATELY FOR KHARIF AND RABI SEASON, AS THE TWO GRAPHS IF PLOTTED ON THE SAME ABSCISSA OVERLAP EACH OTHER AND BECOME UN-INTELLIGIBLE.

V.N. Mantes

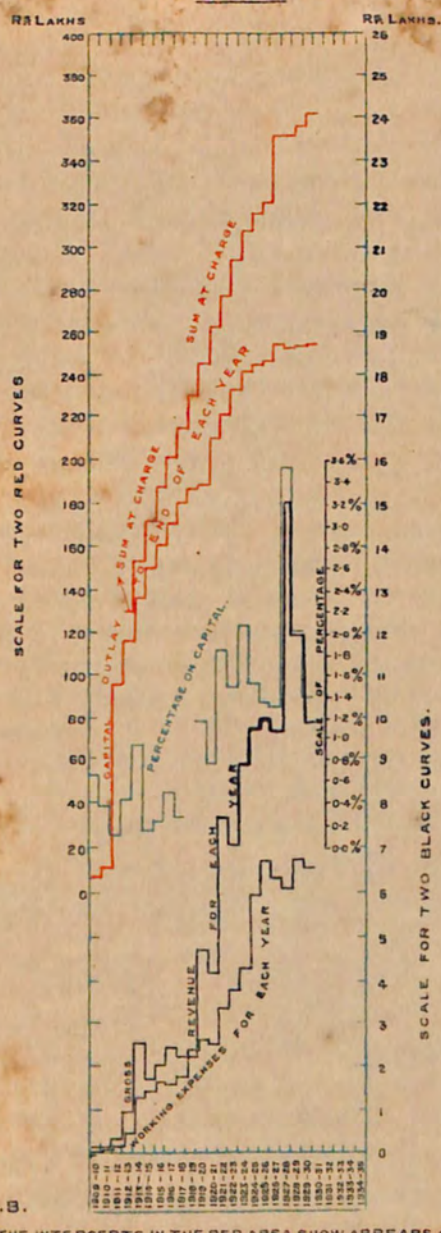
Sd/- SUPERINTENDING ENGINEER,
DECCAN IRRIGATION.

GOVT. PHOTO-LITHO OFFICE, POONA, 1930.

GODAVARI & PRAVARA CANALS COMBINED

FINANCIAL RECORD.

— 1929-30 —



N.B.

THE INTERCEPTS IN THE RED AREA SHOW ARREARS OF INTEREST UNPAID UP TO END OF EACH YEAR, WHICH BEING ADDED TO THE CAPITAL GIVE SUM AT CHARGE.

THE INTERCEPTS BETWEEN THE BLACK CURVES GIVE THE NET INCOME EACH YEAR

NAME OF CANAL	CONSTRUCTION COMMENCED IN	CANAL WAS OPENED IN
GODAVARI CANALS	1907	1911-12
PRAVARA CANALS	1909	1909-10

V.M. Mantes 23/1/31
AG. SUPERINTENDING ENGINEER,
DECCAN IRRIGATION.

24/1/31
EXECUTIVE ENGINEER,
AHMEDNAGAR DIVISION.

S.P.Z.O. Poona, 1931.

NASIK IRRIGATION DIVISION.

CHANKAPUR TANK—GIRNA LEFT BANK CANAL.

61. This is a comparatively small irrigation system in the Nasik Collectorate comprising a storage reservoir at Chankapur and the Girna Left Bank Canal, about 19 miles long. The tank is situated on the Girna river, a tributary of the Tapti, and is formed by a masonry dam 140 feet high, impounding 1,500 million cubic feet of water. The dam was completed in 1909-10. The total area under command of the canal is 29,182 acres of which 8,500 acres will be irrigated annually when irrigation is fully developed. The designed discharge of the canal at head is 90 cusecs and at tail 15 cusecs, the depth of water at full supply being 4½ and 2 feet respectively. The canal has been in operation since 1909-10. Its extension was completed in 1920-21. The extension has been designed to carry about 40 cusecs.

62. On 1st April, the level of water in the tank was 83 feet above the sill of the lowest outlet, the corresponding contents being 1,065·22 million cubic feet. The level fell to 74·5 feet on 27th June when replenishment commenced. It gradually rose to 91·1 feet above the sill of the outlet on 25th August, the contents being 1,490·45 million cubic feet. Draw-off for irrigation commenced on 8th January. On 31st March, the level of water was 81·98 feet above the sill of the outlet, the contents being 1,021·25 million cubic feet. The run-off from the catchment of the tank (100 square miles) was 4,451 million cubic feet, the average of the rain gauge readings being 45·43 inches. The rainfall in the canal tract amounted to 19·89 inches which was not sufficient and late for monsoon crops.

63. The following table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated		Irrigation assessment		Gross assessment	
1929-30	Average	1929-30	Average	1929-30	Average
Acres	Acres	Rs.	Rs.	Rs.	Rs.
3,920	7,390	43,190	51,045	44,341	52,203

Working expenses		Realisations		Rainfall	
1929-30	Average	1929-30	Average	1929-30	Average
Rs.	Rs.	Rs.	Rs.	Inches	Inches
60,452	52,849	43,638	41,534	19·89	21·01

The heavy decrease in the area irrigated and the consequent decrease in assessment were due to water not being taken for irrigation by the cultivators, there being practically no irrigation in the rabi season. The cost of measuring establishment amounted to Rs. 306 which gives a rate of 1 anna and 3 pies per acre as compared with 1 anna and 9 pies in the previous year. The high cost of measurement is due to the high cost of labour and to the scattered nature of irrigation. The expenditure incurred on maintenance and repairs amounted to Rs. 14,554. The area of two-seasonal leases sanctioned under the canal was 41 acres during the year.

KADWA RIVER WORKS.

64. These works which came into operation in 1868-69 consist of three small canals, viz. the Palkhed, Ojhar Tambat and Wadali, taking off from weirs across the Kadwa river and its tributary the Banganga and comprising 38 miles of canals and distributaries. The storage is at Waghad. The Waghad tank is a Ghat-fed storage on the Kolvan river in Nasik District. It is remarkable for the size of its earthen dam which attains a height of 96 feet where it crosses the gorge of the river. The designed discharges of the Palkhed Canal at head and at tail are 90 and 15 cusecs respectively, the corresponding depths of water at full supply being 4½ and 2 feet. The designed discharges of the Ojhar Tambat Canal at head and at tail are 33 and 5 cusecs respectively, the depths at full supply being 3 and 1 foot respectively. The designed discharges of the Wadali Canal at head and at tail are 19 and 5 cusecs respectively, the depths of water at full supply being 2 and 1 foot respectively.

65. On 1st April, the depth of water in Waghad tank was 40·35 feet above the sill of the outlet, the corresponding contents being 387·88 million cubic feet. The level fell gradually to 33 feet on 16th June, the contents being 245·1 million cubic feet. The tank then received regular replenishment and filled to its full supply level of 48 feet above the sill of the outlet on 20th September, the corresponding contents being 605·55 million cubic feet. The waste weir overflowed on 12th July and the maximum depth of flood above the crest of the waste weir was 8 feet on 20th September. The automatic waste weir gates were finally closed on 13th October, maintaining the full supply level equivalent to a volume of 605·55 million cubic feet. The draw-off for irrigation from the storage commenced on 24th October with 47·8 feet depth of water in the tank, representing a volume of 598·93 million cubic feet. The level fell to 40·45 feet above the sill of the outlet on 31st March, the contents being 392·38 million cubic feet. The run-off from the catchment of the tank (29 square miles) was 1,880 million cubic feet, the average of the rain-gauge readings being 47 inches. The average rainfall in the canal tract was 22·64 inches. The year on the whole was a favourable one, as the rainfall was timely and sufficient.

66. The sub-joined table gives the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Name of canal	Area irrigated		Irrigation assessment		Gross assessment	
	1929–30	Average	1929–30	Average	1929–30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Palkhed Canal ..	1,307	1,638	18,989	19,940		
Ojhar Tambat Canal ..	827	878	11,501	11,610	43,800	44,906
Wadali Canal ..	735	828	9,674	9,535		

Name of canal	Working expenses		Realisations		Rainfall	
	1929–30	Average	1929–30	Average	1929–30	Average
	Rs.	Rs.	Rs.	Rs.	Inches	Inches
Palkhed Canal ..						
Ojhar Tambat Canal ..	38,198	58,875	45,757	43,174	22·64	24·58
Wadali Canal ..						

The decrease in the area irrigated and assessment was due to timely and good rainfall and consequent less demand for canal water for irrigation in both the kharif and rabi seasons. On the entire lengths of the canals perennial irrigation is allowed subject to the restriction of sugarcane cultivation within ¼ mile limit of villages. Owing to the limited supply in Waghad tank, the canals though classed as perennial are not really so and sugarcane has usually to depend on well water to supplement canal irrigation. The area of two-seasonal leases sanctioned during the year was 185 acres. The cost of measuring establishment amounted to Rs. 239 equivalent to a rate of 1 anna and 4 pies per acre as compared with 1 anna and 10 pies of the previous year. This high rate is due to the high cost of labour and to the scattered nature of irrigation. The expenditure incurred on maintenance and repair works amounted to Rs. 11,268.

Parsul Tank.

67. This small tank depends solely on local rains for its supply and generally stores sufficient water for the monsoon and rabi crops. It was maintained and repaired at a cost of Rs. 484 during the year under report. On 1st April, the level of water in the tank was 22·6 feet above the sill of the outlet, the contents being 53·94 million cubic feet. The level went down to 14·5 feet on 15th June, the contents then being 24·26 million cubic feet. Thereafter replenishment was received and the level gradually rose to 33·9 feet above the sill of the outlet, the corresponding contents being 110·72 million cubic feet. The draw-off for irrigation

commenced on 20th July when the level of water was at 31·2 feet with 94·38 million cubic feet of storage. On 31st March, the level was 25·8 feet the contents being 68·28 million cubic feet. The monsoon rainfall over the catchment area of the tank was normal and sufficient and was evenly spread over the whole season. The area of two seasonal leases sanctioned during the year was 12 acres.

68. The following table shows the results of irrigation, revenue, etc., during the year as compared with the average of the past three years :—

Area irrigated		Irrigation assessment		Gross assessment	
1929-30	Average	1929-30	Average	1929-30	Average
Acres	Acres	Rs.	Rs.	Rs.	Rs.
1,501	1,256	7,207	6,814	7,532	7,041

Working expenses		Realisations		Rainfall	
1929-30	Average	1929-30	Average	1929-30	Average
Rs.	Rs.	Rs.	Rs.	Inches	Inches
1,727	2,036	8,759	4,769	13·33	16·29

The increase in the area irrigated and assessment was due to sufficiency of supply in the tank in the kharif season. In the rabi season the irrigators refused to take any water. The cost of measuring establishment was 1 anna and 7 pies per acre against 1 anna and 6 pies in the previous year.

CENTRAL CIRCLE.

SHOLAPUR DIVISION.

69. The area irrigated, gross assessment and working expenses of the four tanks noted below are given in the following table and are compared with the average of the preceding three years :—

Name of tank	Area irrigated		Gross assessed revenue		Working expenses	
	1929-30	Average	1929-30	Average	1929-30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Ekruk	5,051	3,859	1,61,212	1,33,099	20,597	27,432
Koregaon	570	423	2,673	2,277	2,223	2,555
Ashti	4,701	4,126	29,739	27,134	8,940	12,248
Pathri	1,148	1,071	14,304	13,037	5,529	3,776

The increase in the area irrigated under all the tanks was due to increased demand for irrigation.

Ekruk Tank.

70. The Ekruk tank near Sholapur, which came into operation in 1872-73, is an artificial reservoir formed by a large earthen embankment 7,000 feet long with a maximum height of 76 feet. It supplies water not only for irrigation but also to the town of Sholapur, the Mills and the G. I. P. Railway. Under unfavourable conditions of replenishment, which occur periodically, the tank does not meet all the demands, agricultural and non-agricultural, made on it and the question of providing a supplementary storage tank is under contemplation.

71. On 1st April, the level of water in the tank was 35·56 feet above the sill of the lowest outlet. The level fell gradually to 29·78 feet on 17th September. The tank received replenishment of only 1·84 feet between 18th September and 7th October, when the total storage amounted to 1,456·12 million cubic feet, representing a height of 30·73 feet over the sill of the lowest outlet. The supply was used to the best possible advantage in meeting demands, both irrigational and non-irrigational and an additional area of 1,000 acres was allowed a single watering in the rabi season. The mean rainfall gauged at five stations in the catchment of the tank (159 square miles) was 12·31 inches against 28·69 inches of the preceding year. The total replenishment received in the tank amounted to 236·99 million cubic feet.

Koregaon Tank.

72. On 1st April, the level of water in the tank was 6·74 feet over the sill of the outlet. The level fell to 5·03 feet on 3rd June. Due to the rainfall of 4·2 inches on 4th June and further rainfall to end of September the tank received a replenishment of 10·98 feet. The storage was fully utilised in meeting the demands of lease-holders both in the kharif and rabi seasons. The rainfall gauged at Koregaon was 18·89 inches against 22·48 inches of the preceding year. The total replenishment received in the tank was 60·34 million cubic feet.

Ashti Tank.

73. On 1st April, the level of water in the tank was 17·03 feet over the sill of the outlet. The level gradually fell to 15·21 feet on 5th June. With the replenishment received between 6th June and 5th October, the level rose to 16·97 feet. The mean rainfall gauged at two stations in the catchment of the tank was 16·85 inches against 26·48 inches of the preceding year, the total replenishment received being 361·93 million cubic feet.

Pathri Tank.

74. On 1st April, the level of water in the tank was 27·05 feet over the sill of the outlet. The level gradually fell to 24·95 feet on the 3rd June. On 4th June, there was a good rainfall which raised the level of water by 3·5 feet. With further replenishment the waste weir overflowed from 19th September. The storage was utilised in meeting the demands of irrigators both in the kharif and rabi seasons and the requirements of Barsi Municipality. The mean rainfall gauged at two stations in the catchment area of the tank was 25·26 inches against 27·86 inches of the preceding year. The total replenishment received amounted to 1,399·48 million cubic feet,

AHMEDNAGAR DIVISION.

BHATODI TANK.

75. This is a small tank situated on the Mehekari river about 12 miles from Ahmednagar. It depends entirely on local rain for its supply, which generally suffices for the monsoon and part of the rabi season. The tank is heavily silted and its capacity reduced from 154 to 39·44 million cubic feet. To increase the capacity it is proposed to raise the level of the waste weir by one foot. The total rainfall during the year was 15·36 inches. The tank received its first replenishment on 5th June, dried up on 27th August, and again received further replenishment on 9th September. The highest level reached was R.L. 95 on 1st October or 2·5 feet above the level of the waste weir. The tank overflowed on 1st and 2nd October and dried up on 14th December. The area irrigated, gross assessment and working expenses as compared with the average of the preceding three years were as under :—

Area irrigated		Gross assessed revenue		Working expenses	
1929-30	Average	1929-30	Average	1929-30	Average
Acres	Acres	Rs.	Rs.	Rs.	Rs.
643	684	7,867	8,362	6,860	4,577

EAST KHANDESH DIVISION.

JAMDA CANALS.

76. The source of supply of these canals is the Girna river supplemented from time to time by water from the Chankapur tank. The lowest discharge of the river during the year was 30 cusecs on 31st May. The highest flood occurred on 22nd June, when the depth of water over the crest of the Jamda weir was 2·1 feet, and the discharge was 13,286 cusecs. The rainfall in the catchment of the canals was 16·38 inches against 27·75 inches of the preceding year. The subjoined table shows the area irrigated, gross assessment, and working expenses during the year as compared with the average of the preceding three years :—

Area irrigated		Gross assessed revenue		Working expenses	
1929-30	Average	1929-30	Average	1929-30	Average
Acres	Acres	Rs.	Rs.	Rs.	Rs.
1,612	1,104	12,821	10,103	12,263	10,549

The increase in the area irrigated was due to increased demand for water in the kharif season. The increase in revenue was also due to the large realisation from the sale of mango fruit.

Hartala Tank.

77. On 1st April, the level of water in the tank stood at R.L. 82·78, the contents being 134·9 million cubic feet. The tank dried up on 31st May. The first replenishment was received on 21st June and the maximum level reached was R.L. 85·9 on 13th July, the contents being 31·03 million cubic feet. The rainfall during the year was 19·69 inches against 29·29 inches of the previous year. The exposed land within the tank contour was let out for cultivation from which a revenue of Rs. 127 was realised.

Mhaswa Tank.

78. On 1st April, the level of water in the tank stood at R.L. 146·76, the contents being 89·96 million cubic feet. The first replenishment was received on 20th June, and the maximum level reached was R.L. 151·7 on 6th July, the contents being 166·51 million cubic feet. The rainfall was 17·65 inches against 27 inches of the previous year.

79. The area irrigated under the Hartala and Mhaswa tanks, gross assessment and working expenses during the year as compared with the average of the preceding three years are given in the following table :—

Name of tank	Area irrigated		Gross assessed revenue		Working expenses	
	1929-30	Average	1929-30	Average	1929-30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Hartala	176	49	1,350	869	1,026	899
Mhaswa	664	464	3,054	2,809	1,372	1,823

The increase in the area irrigated was due to greater demand for water in the rabi season in the case of Mhaswa tank and in the kharif season in the case of Hartala tank. The increase in revenue was also due to the enhanced realisation from the sale of grass and from bed-cultivation.

WEST KHANDESH DIVISION.

Shahada Channel.

80. This channel is fed by the Gomai river which is in perennial flow. The supply was adequate throughout the year. The rainfall at Shahada during the year was 27·49 inches against 24·07 inches of the previous year. The demand for water was less owing to the sufficient and seasonal rainfall in the irrigated area. The area irrigated, gross assessment and working expenses during the year as compared with the average of the preceding three years are given below :—

	Area irrigated	Gross assessed revenue	Working expenses
	Acres	Rs.	Rs.
Average	1,917	10,893	5,092
1929-30	1,602	9,739	9,353

Lower Panjhra River Works.

81. These are the oldest Government irrigation works in the Deccan. They date from 1851-52 and were constructed at a cost of about Rs. 5 lakhs. They consist of small weirs across the Panjhra river with the addition of the small Mukti tank on a tributary of the same river from which a supplementary supply is obtained in the rabi season.

82. On 1st April, the contents of the Mukti tank were 229·48 million cubic feet, decreasing to 195·83 million cubic feet before the first replenishment was received on 18th June. The maximum storage reached was 300·16 million cubic feet on 27th July, as compared with 320·03 million cubic feet in the preceding year. It gradually fell to 90·6 million cubic feet on 31st March. The rainfall in the area of the Lower Panjhra River Works was generally insufficient, and the flow in the river was small. There was consequently much demand for irrigation water. The mean rainfall gauged in the catchment of the Mukti tank was 14·59 inches, against 32·07 inches of the preceding year. The area irrigated, gross assessment and working expenses during the year as compared with the average of the previous three years are given below :—

	Area irrigated	Gross assessed revenue	Working expenses
	Acres	Rs.	Rs.
Average	2,468	25,813	9,905
1929-30	2,499	26,915	6,679

Satara Division.

83. The area irrigated, gross assessment and working expenses of the 6 works mentioned below, as compared with the average of the preceding three years, are given in the following statement :—

Name of work	Area irrigated		Gross assessed revenue		Working expenses	
	1929-30	Average	1929-30	Average	1929-30	Average
	Acres	Acres	Rs.	Rs.	Rs.	Rs.
Krishna Canal ..	6,183	6,040	71,242	59,474	18,715	26,500
Rewari Canal ..	962	647	5,529	3,036	3,696	2,004
Upper Man River Works.	1,385	1,342	6,079	5,694	7,818	6,397
Yerla River Irrigation Works.	6,361	4,467	29,368	20,993	22,232	59,958
Chikhli Canal ..	510	357	2,696	1,786	1,771	1,389
Maini Tank ..	2,713	1,914	12,079	7,332	6,218	4,874

The increase in the area irrigated and the consequent increase in assessment on all the above works was due to the adequate supply of water in the rivers and tanks as the result of sufficient though untimely rainfall in their catchments and scanty rainfall in the canal area in the rabi season, which resulted in increased demand for canal water.

KRISHNA CANAL.

84. The total rainfall gauged at Retre Budruk, which is at the centre of the canal tract, was 25·6 inches against 22·17 inches of the past year. In the monsoon the rainfall was sufficient and well distributed, but in the rabi season it was very scanty. Owing to sufficient supply in the river, perennial irrigation increased and on account of the rainfall in May, sufficient water was available for the increased area of sugarcane in the hot season.

REWARI CANAL.

85. The rainfall gauged at Rewari, which is one mile below the bandhara, was 28 inches against 23·65 inches of the past year. In the monsoon the rainfall was sufficient but in the rabi season it was very scanty. The supply in the river in April was very low but it improved in June and the river was in flood in September and again in October. The supply was sufficient for the rabi crops and was distributed by rotation.

UPPER MAN RIVER WORKS.

86. On 1st April, the level of water in Pingli tank was at R.L. 2,356·99, the corresponding contents being 14·69 million cubic feet. The supply was utilised for irrigating hot weather crops. The first replenishment was received on 16th June and the level of water stood at R.L. 2,355·99. The tank was dry from 12th August to 13th September. On 14th September, a second replenishment was received and the level of water rose to R.L. 2,356·89. The highest level reached was R.L. 2,371·09 on 20th September, the corresponding contents being 154·77 million cubic feet. Water flowed over the waste weir from 4th October to 15th November. The rainfall gauged at Gondowla, which is about three miles below the tank, was 27·94 inches against 21·58 inches of the past year.

YERLA RIVER IRRIGATION WORKS.

87. On 1st April, the contents of the Nehr tank amounted to 196·72 million cubic feet. Replenishment was received on 20th April when the level of water reached R.L. 2,658·82 equivalent to 227·63 million cubic feet. The level subsequently fell and on 3rd June it was at R.L. 2,657·96 equivalent to 209·54 million cubic feet. Thereafter the supply began to increase on account of the frequent replenishments received, and the tank was full on 18th September when the level was at R.L. 2,666·32 equivalent to 406·8 million cubic feet. Water flowed over the waste weir from 18th September to 22nd October. Water was issued in the full length of the canal to all the area under command. The rainfall gauged at Khatgaon, which is about 4 miles below the tank, was 29·15 inches as compared with 25·68 inches of the past year.

CHIKHLI CANAL.

88. The rainfall gauged at Chikhli, which is at the centre of the canal tract, was 18·2 inches against 23·03 inches of the past year. In

the monsoon the rainfall was untimely and in the rabi season it was very scanty. On 1st April, there was no flow in the river. There were two floods, one on 7th April and the second on 11th April. The supply was utilised for irrigating hot weather crops. A flood 7 feet high occurred on 4th October and the flow in the river lasted till 14th February.

Maini Tank.

89. On 1st April, the tank was dry. The first replenishment was received on 22nd April and the level of water reached R.L. 2,297·72 equivalent to 3·24 million cubic feet. Further replenishment was received on 5th June and the level rose to R.L. 2,302·52 equivalent to 44·61 million cubic feet. The highest level reached during the year was R.L. 2,305·52 on the 17th September and the 2nd October. Water flowed over the waste weir from 17th to 22nd September and from 28th September to 23rd November. The supply available was utilised for irrigating rabi crops. The rainfall gauged at Maini was 28·23 inches against 24·53 inches of the past year.

SOUTHERN CIRCLE.

DHARWAR DIVISION.

Muchkundi Tank.

90. This tank is the only firstclass irrigation work in Dharwar Division. It depends entirely on local rains. Due to the precarious rainfall and the smallness of the catchment area the supply in the tank is uncertain. The rainfall gauged at the tank during the year was 17·38 inches. There were no applications for water in the Kharif season. The area irrigated under the tank and the assessment thereon were 22 acres and Rs. 172 respectively. There were no miscellaneous receipts as the right to cultivate the tank-bed had been leased for a period of three years and the proceeds amounting to Rs. 4,700 had already been realised in 1927-28. The total working expenses amounted to Rs. 1,666. The operations of the year resulted in a loss of Rs. 1,494 as compared with a loss of Rs. 1,419 in the previous year.

DHARWAR IRRIGATION DIVISION.

Gadikeri Tank.

91. There is no raingauge installed in the catchment of this tank. The tank was dry at the beginning of the year. On 16th April it received some replenishment, when the water in the tank rose to R.L. 42·02 or 1·15 feet above the sill. This level was maintained till the middle of August. The tank was again dry on the 7th September. Thereafter the water level again rose and reached R.L. 48·25 on 13th October. The level fell to R.L. 44·3 or 3·3 feet above the sill on 31st March. The lands under this tank are assessed at consolidated rates. The area irrigated and the irrigation share of land revenue were 407 acres and Rs. 2,356 respectively. There were no miscellaneous receipts. The working expenses amounted to Rs. 383. The operations of the year

resulted in a net profit of Rs. 1,973 or 11·68 per cent. on the capital cost of Rs. 16,918.

Gokak Canal.

92. This canal is the most important irrigation work in the Southern Circle. The system consists of a reservoir formed by a masonry weir across the Ghataprabha river at Dhupdal in the Belgaum District, a short distance above the Gokak Falls, with 16 miles of main and branch canals and 36 miles of distributaries. It first came into operation in 1884–85. The weir is nearly 3,000 feet long and 27 feet high forming a reservoir of 1,469 million cubic feet capacity. The water thus stored is utilised partly for supplying the Mills, which were erected at the Falls in 1885, and partly for irrigation. The canal commands an area of 18,668 acres, the area irrigable being 17,627 acres. Though the Dhupdal storage is mainly intended for irrigating lands under the canal, a stipulated quantity of water is issued to the Gokak Mills Company in accordance with an agreement between Government and the Company, in consideration of which a sum of Rs. 14,313 is paid annually by the Company, subject to a rebate in the event of the supply falling short of that contracted for. Removable wooden shutters are fixed over the weir crest at the end of the monsoon for the storage of an additional quantity of 561 million cubic feet of water after the normal monsoon flow ceases in the river.

93. On 1st April, the level of water in the reservoir was 20·9 feet above the sill. The level rose to 24·5 feet on 6th July and thereafter gradually fell to 19·9 feet on 7th September. With a gradual replenishment it again rose to the temporary crest level on 6th October. The draw-off commenced on 25th December. On 31st March, the level of water was 20·22 feet. In order to diminish the silt deposit in the reservoir clearance of vegetable growth and weeds was carried out at an expenditure of Rs. 1,000 during the year. The area irrigated and the assessment were 11,437 acres and Rs. 78,339 respectively against 9,747 acres and Rs. 66,220 in the previous year and 10,636 acres and Rs. 70,402, the average of the past three years. The increase both in area and assessment is due to the insufficient rainfall and consequent demand for irrigation water. Water was also supplied to the Madras and Southern Maratha Railway Company at Hukeri Road Station for engines and passengers at the fixed rate of Rs. 50 per month. The total amount recovered from the Railway amounted to Rs. 550. The following table gives the results of revenue etc. as compared with the previous year :—

	1929-30	1928-29
	Rs.	Rs.
Miscellaneous revenue assessed	19,314	19,564
Gross assessed revenue	97,653	84,415
Working expenses	17,865	13,510

The operations of the year resulted in a net profit of Rs. 79,788 which is equivalent to 5·44 per cent. on the capital cost of Rs. 14,66,167. The cost of crop measurements amounted to Rs. 1,648, which works out to 2 annas 4 pies per acre against 2 annas 9 pies of the previous year.

...Dambal Tank.

94. The rainfall during the year was favourable for irrigation. The lands under this tank are assessed partly at water rates and partly at consolidated rates. The area irrigated and the irrigation assessment were 335 acres and Rs. 1,606 respectively. The area assessed at consolidated rates was 143 acres and the irrigation share of land revenue amounted to Rs. 916, giving an average rate of Rs. 6·39 per acre. The total assessed revenue for the year amounted to Rs. 3,290 including miscellaneous receipts (Rs. 768) against Rs. 3,978 of the previous year and Rs. 3,951, the average of the past three years. The decrease is due to a decrease in the rabi area and also to less miscellaneous receipts. The working expenses amounted to Rs. 686. The operations of the year resulted in a net profit of Rs. 2,604 or 4·07 per cent. on the capital cost of Rs. 63,980.

Medleri Tank.

95. On 1st April, the level of water in the tank was at R.L. 168·45 or 3·45 feet above the sill. The tank received its first replenishment on 6th April and was filled to the full supply level by the 28th September, the highest level reached being R.L. 180·1. On 31st March, the level was at R.L. 170·95 or 5·95 feet above the sill. The area irrigated, revenue, etc., as compared with the preceding year are given below :—

	1929-30.	1928-29.
Area irrigated	39 acres.	92 acres.
Irrigation assessment	Rs. 470	Rs. 726
Gross assessed revenue	Rs. 868	Rs. 1,003
Working expenses	Rs. 1,029	Rs. 1,108

The decrease was due to timely rainfall and consequent less demand for irrigation water. The year's working showed a deficit of Rs. 161.

Madag Tank.

96. On 1st April, the tank held 2·35 feet of water above the sill of the outlet. The waste weir overflowed from 7th June to 20th January. The highest level reached was R.L. 18,84·76 or 7·05 feet above the crest of the weir. On 31st March, the level was at R.L. 1,874·17 or 0·91 foot above the sill of the outlet. The area irrigated and the assessment were 468 acres and Rs. 2,256 respectively against 427 acres and Rs. 2,017 of the previous year and 420 acres and Rs. 1,956, the average of the previous three years. The increase is due to better demand for water in the rabi season. The total assessed revenue including miscellaneous receipts (Rs. 309) amounted to Rs. 2,565 against Rs. 3,080 of the previous year and Rs. 2,495, the average of the past three years. The decrease over the previous year was due to decrease in miscellaneous receipts. The working

expenses amounted to Rs. 1,921. The year's working showed a net profit of Rs. 644 or 0·38 per cent. on the capital outlay of Rs. 1,67,598.

Asundi Tank.

97. On 1st April, the level of water in the tank was at R.L. 102·65 or 3·65 feet above the bed. On 26th June, water reached the highest level of R.L. 105·75 or 6·75 feet above the bed. Due to the failure of rabi rains the tank was dry on 30th January. The lands under this tank are assessed partly at water rates and partly at consolidated rates. The area irrigated and the irrigation assessment were 80 acres and Rs. 602, respectively, against 85 acres and Rs. 373 of the previous year and 95 acres and Rs. 580, the average of the past three years. The decrease in area was due to insufficient supply in the tank on account of scanty rainfall during the year. The area under consolidated assessment was 190 acres and the irrigation share of land revenue amounted to Rs. 686. The gross assessed revenue including miscellaneous receipts (Rs. 155) amounted to Rs. 1,443 against Rs. 1,167 of the previous year and Rs. 1,499, the average of the previous three years. The working expenses amounted to Rs. 1,235, giving a net profit of Rs. 208 against a deficit of Rs. 182 in the previous year.

Mavinkop Tank.

98. On 1st April, the level of water in the tank was at R.L. 104·7 or 4·7 feet above the sill and rose to R.L. 105 on 2nd July. On 19th October, water reached the highest level of R.L. 109·6. On 31st March, the level fell to R.L. 105·9 or 5·9 feet above the sill. The area irrigated under this tank is assessed at consolidated rates. The area irrigated and the irrigation share of land revenue were 415 acres and Rs. 1,304 respectively against 412 acres and Rs. 1,297 of the previous year. The working expenses amounted to Rs. 277 giving a net profit of Rs. 1,027 or a return of 3·06 per cent. on the capital cost of Rs. 33,504.

Dharma Canal.

99. This canal is fed by the Dharma river. Water was admitted into the canal on 10th June and the canal ceased to flow from 12th January. The lands under this canal are assessed partly at water rates and partly at consolidated rates. The area irrigated and the irrigation assessment thereon were 496 acres and Rs. 3,276 respectively, the corresponding figures for the previous year being 436 acres and Rs. 2,903, and the average of the preceding three years being 427 acres and Rs. 2,606. The area irrigated under consolidated assessment was 5227 acres and the irrigation share of land revenue amounted to Rs. 20,764, giving a rate of Rs. 3·97 per acre. The total assessed revenue after deducting Rs. 23,156 to be credited to the old work amounted to Rs. 884. The working expenses amounted to Rs. 1,975. The result of the year's operations showed a loss of Rs. 1,091 against a loss of Rs. 1,954 in the previous year,

100. The following statement gives the rainfall gauged at the sites of the works as compared with the average rainfall of the previous ten years :—

—	Dharma + Canal (Yekkambi)	Muchkundi tank	Dambal tank	Medleri tank	Madag tank	Asundi tank	Gokak Canal (Dhupdal)
	Inches	Inches	Inches	Inches	Inches	Inches	Inches
Kharif ..	58·24	5·38	10·15	12·17	17·65	5·09	9·18
Rabi ..	9·02	9·99	6·53	6·10	7·40	2·21	2·29
Total ..	67·26	15·37	16·68	18·27	25·05	7·30	11·47
Average of the last ten years.	80·69	11·50	13·99	16·12	24·17	19·14	17·38

SECTION II

COMPRISING IRRIGATION WORKS FOR WHICH NEITHER CAPITAL NOR REVENUE ACCOUNTS ARE KEPT.

GENERAL REMARKS.

101. The area of irrigation under, and revenue due from works for which neither capital nor revenue accounts are kept in the Deccan and Gujarat as recorded in the register of these works are 2,82,893 acres and Rs. 9,21,883 respectively. The following tables give by Districts, details of the area irrigated, expenditure, revenue, etc., in respect of irrigation works on which expenditure was incurred during the year :—

TABLE I.

Showing the area irrigated in the different Districts in the Deccan and Gujarat and the consolidated land revenue and water rates assessed and recovered during the year 1929-30 in respect of irrigation works (for which neither capital nor revenue accounts are kept) on which expenditure was incurred during the year.

Collectorate	Number of works	Area irrigated	Revenue			Remarks
			Irrigation share	Land share	Total	
		Acres	Rs.	Rs.	Rs.	
Ahmedabad ..	29	128	(a) 118	789	907	(a) Water rates—Direct Receipts.
Kaira ..	52	7,082	(b) 19,049	26,023	45,072	(b) Includes Rs. 6,278 water rates—Direct Receipts.
Panch Mahals ..	20	2,192	(c) 5,902	1,436	7,338	(c) Includes Rs. 5,214 water rates—Direct Receipts.
Surat	66	3,050	8,272	33,634	41,906	
Broach	9	194	312	1,061	1,373	
East Khandesh ..	2	435	3,586	1,325	4,911	
West Khandesh ..	1	425	(d) 678	....	678	(d) Water rates—Direct Receipts.
Nasik	45	6,397	(e) 52,274	10,521	62,795	(e) Includes Rs. 3,386 water rates—Direct Receipts.
Poona	2	632	(f) 3,258	966	4,224	(f) Includes Rs. 68 water rates—Direct Receipts.
Sholapur	1	794	(g) 3,765	....	3,765	
Belgaum	40	3,259	12,784	3,216	16,000	
Dharwar	82	7,940	23,863	6,110	29,973	
Kanara	31	2,378	6,008	1,455	7,463	
Bijapur	2	140	464	289	753	
Ratnagiri	1	211	827	....	827	
Ahmednagar ..	2	90	(g) 265	....	265	(g) Water rates—Direct Receipts.
Total ..	385	35,347	1,41,425	86,825	2,28,250	

TABLE

Showing actual expenditure and receipts for the year 1929-30 on the nor revenue accounts

Collectorate	Expenditure						
	Direct charges						
	Extensions and improvements	Maintenance and repairs	Establishment	Tools and plant	Total	Share of collection charges	Grand Total
1	2	3	4	5	6	7	8
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ahmedabad ..	6,287	18,579				12	
Kaira	5,372	19,210	12,049	654	76,548	1,905	78,741
Panch Mahals ..	1,980	12,417				276	
Surat	....	36,488	7,464	406	47,422	827	48,280
Broach	....	3,064				31	
West Khandesh ..	....	518	369	24	911	14	925
East Khandesh ..	....	378	135	18	531	359	890
Ahmednagar ..	1,76,183	9,801	65,721	8,718	2,60,423	5	2,60,428
Nasik	1,872	29,633	29,037	716	61,258	4,957	66,215
Poona	34,978	4,899	80,384	1,087	1,21,348	320	1,34,868
		8,113	4,949	138	13,200		
Sholapur	23	2,012	719	95	2,849	75	2,924
Belgaum	491	15,544				1,278	
Dharwar	8,272	37,131	32,451	2,077	1,09,296	2,386	1,13,561
Kanara	....	13,330				601	
Thana	....	70	12	1	83	....	83
Ratnagiri	....	3,718	1,618	105	5,441	83	5,524
Bijapur	....	640	278	18	936	46	982
Total ..	2,35,458	2,15,545	2,35,186	14,057	7,00,246	13,175	7,13,421

II.

irrigation works in the Deccan and Gujarat for which neither capital are kept.

Actual Receipts						
Direct Receipts			Indirect receipts—Share of consolidated Revenue	Grand Total Direct and Indirect Receipts	Refunds of Revenue	Gross receipts less refunds
Water rates from irrigation	Miscellaneous	Total Direct Receipts				
9	10	11	12	13	14	15
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
118	410	528	....	528		528
6,278	5,595	11,873	12,771	24,644		24,644
5,214	6,056	11,270	688	11,958		11,958
....	4,464	4,464	8,272	12,736		12,736
....	....	....	312	312		312
678	21	699	....	699		699
....	....	....	3,586	3,586		3,586
265	1,763	2,028	....	2,028		2,028
3,386	1,692	5,078	48,888	53,966	Nil.	53,966
68	....	68	3,190	3,258		3,258
3,765	1,923	5,688	....	5,688		5,688
....	6	6	12,784	12,790		12,790
....	478	478	23,863	24,341		24,341
....	76	76	6,008	6,084		6,084
....	....	....	....	....		....
....	....	....	827	827		827
....	....	....	464	464		464
19,772	22,484	42,256	1,21,653	1,63,909		1,63,909

DETAILED REPORTS* BY LOCAL OFFICERS.

NORTHERN CIRCLE.

AHMEDABAD, KAIRA AND PANCH MAHALS AND SURAT AND BROACH DIVISIONS.

..KHARI SLUICES.

102. There were only 4 floods during the year in the Khari river at Pinglaj, the head of the Khari sluices system, their discharges being 192, 198, 363 and 390 cusecs. The first flood occurred on 21st June, and in August the flow in the river subsided. Consequently rotations according to Kalambandhi rules had to be started from 1st August instead of from 20th September as usual. As there was no rain after August, the flow diminished to 40 cusecs and less by the middle of September. The result was that out of 7,238 acres of land assessed to himayat, only 4,426 acres were transplanted with rice in the 11 Kalambandhi villages of Matar taluka, District Kaira. With a view to save this area it was decided to divert the small flow in the river into the Khari Cut Canal and to let it back into the river near Badaj with the addition of about 30 to 35 cusecs from the Bokh reservoir. This diversion was carried out from 30th September to 3rd November with a view to save large losses in transit in the sandy bed of the river, and two rotations of 20 days each with an average discharge of 30 cusecs were given to the 11 Kalambandhi villages. Non-himayat paying area of about 392 acres was also irrigated in these villages and crops came to maturity with the exception of a few acres, on which remission was granted. The sluices including the Goblaj tank and the Bherai reservoir were maintained in good order at a cost of Rs. 5,196. A sum of Rs. 877 was also spent on special repairs to sluice No. 2. The miscellaneous revenue under the Khari sluices system amounted to Rs. 369 against Rs. 858 of the previous year. The decrease was due to less sale of babul trees during the year. The following table compares the area irrigated and the assessment with the average of the previous three years :—

	Average		1929-30	
	Area irrigated	Revenue after deducting remissions	Area irrigated	Revenue after deducting remissions
	Acres	Rs.	Acres	Rs.
Irrigation above the Kalambandhi villages.	641	4,079	390	1,053
Irrigation from tanks fed by the Khari river Goblaj.	529	2,306	347	2,728
Galki	346	823	†	312‡
Irrigation from the Khari sluices in the 11 Kalambandhi villages.	6,438	38,488	6,422	38,789
Total ..	7,954	45,696	7,159	42,882

*These reports have been framed on the basis of approximate figures obtained from the accounts for March with the exception of the report for the Southern Circle which has been prepared from final figures of the supplementary accounts.

† No area was irrigated, as the tank was empty.

‡ Arrears of the past years recovered during the year.

The assessment under the Khari sluices in the Kalambandhi villages is consolidated. The average rates per acre for land and water worked out as under :—

	Irrigation share	Land share	Total consolidated
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Government land	0 5 4	6 1 6	6 6 10
Alienated land	0 5 3	2 1 0	2 6 3

Muwalia Tank.

103. This is an important tank situated near Dohad town, having a catchment area of about 39 square miles of hilly tract. It fills in years of normal rainfall but during the year under review it filled only partially owing to deficient rainfall, which at the site of the tank was only 20·45 inches. The total area irrigated under the tank was 1,033 acres and the assessment levied and the realisations made (including arrears of the previous year) amounted to Rs. 3,373 and Rs. 3,929 respectively. Special repairs to the waste weir of the tank were completed at a cost of Rs. 1,850. The miscellaneous revenue realised from all sources amounted to Rs. 340 against Rs. 227 of the previous year. The increase was due to bed-cultivation during the year. The tank with its dam, canal and distributaries was maintained in efficient condition at a cost of Rs. 4,451.

Old Tanks.

104. Improvements to 6 tanks in the Kaira and Panch Mahals Division were carried out at a cost of Rs. 3,053 ; and repairs to 7 tanks in the Ahmedabad, 16 tanks in the Kaira and Panch Mahals and 56 tanks in the Surat and Broach Divisions were executed at a total cost of Rs. 60,643. Besides, special repairs to 18 small irrigation tanks, damaged by the floods of July 1927 in the Kaira and Panch Mahals Division, were carried out during the year at a cost of Rs. 7,965. The area irrigated and revenue derived from the old tanks and bunds were as under :—

Name of Collectorate	Area irrigated	Revenue		
		Irrigation share	Land share	Total consolidated assessment
	Acres	Rs.	Rs.	Rs.
Ahmedabad	9,129	10,366	41,890	52,256
Kaira	2,008	3,414	4,338	7,752
Panch Mahals	270	688	1,436	2,124
Surat	2,082	5,204	29,864	35,068
Broach	787	1,356	4,322	5,678
Total ..	14,276	21,028	81,850	1,02,878

105. The more important works carried out during the year were (*a*) the construction of the Odhav-Solgaum Drain in Viramgam taluka completed at a total cost of Rs. 1,06,872, the expenditure during the year being Rs. 9,408, (*b*) improvements to the Hebatpur Drain in Viramgam taluka which were in progress, the expenditure during the year being Rs. 25,519, and (c) the construction of the Warod Sapoi tank in Jhalod Mahal which was in progress, the outlay during the year being Rs. 1,309. The drainage channels in the Ahmedabad, Kaira and Panch Mahals and Surat and Broach Divisions were maintained in good order at a cost of Rs. 8,147, Rs. 4,144 and Rs. 3,048 respectively. The several bunds constructed in Surat and Broach Collectorates for protecting cultivable lands from inroads of the sea worked fairly satisfactorily. Reclamation bunds near Hansot and Asarsa villages in Broach District continued their process of gradually reclaiming the salt land by siltation. The protective and reclamation works in the Surat and Broach Division were maintained and repaired at a total cost of Rs. 10,258.

DECCAN IRRIGATION CIRCLE.

MUTHA CANALS DIVISION.

KHAMGAON TANK.

106. This partially completed famine tank received good replenishment due to local rains in the monsoon. The available supply was issued for irrigating 181 acres in the monsoon and rabi seasons, which brought in a gross assessed revenue of Rs. 918, the corresponding figures for the previous year being 4 acres and Rs. 23. The maintenance and repair charges on this work amounted to Rs. 402.

BANDHARAS.

107. The subjoined table gives the area irrigated and the revenue assessed from the bandharas in the Poona Collectorate during the year as compared with the average of the past three years :—

	Area irrigated	Consolidated revenue	
		Irrigation share	Land share
	Acres	Rs.	Rs.
1929-30	2,606	12,845	4,880
Average	1,347	7,753	2,707

The expenditure incurred on these bandharas during the year amounted to Rs. 9,097.

NASIK IRRIGATION DIVISION.

KHIRDI SATHE TANK.

108. The management of this small tank was taken over by this Department in 1917. The level of water in the tank on 1st April was

10·55 feet above the outlet sill, the contents being 24·87 million cubic feet. The first replenishment was received on 17th June. The level rose to 15·15 feet above the sill with 50·06 million cubic feet of storage on 4th October. Draw-off for irrigation commenced on 10th July. On 14th February, the storage reached the sill level and the supply of water for irrigation was stopped. The maintenance and repair charges on the work amounted to Rs. 498. The area irrigated during the year was 942 acres, which brought in an irrigation and gross assessed revenue of Rs. 3,806 and Rs. 4,120 respectively, the corresponding figures for the previous year being 656 acres and Rs. 2,735 and Rs. 2,914. The increase in irrigation was due to the recent improvements carried out to the tank. A refund of Rs. 11-10-0 was granted during the year.

BANDHARAS.

109. There are 296 bandharas in the Nasik Collectorate built across small streams having good supply. Out of them 39 were repaired during the year at a cost of Rs. 29,134. The supply to the bandharas was generally good and sufficient. The sub-joined table compares the year's results as regards the area irrigated and the revenue assessed from the bandharas with the average of the past three years :—

	Area irrigated	Consolidated revenue	
		Irrigation share	Land share
	Acres	Rs.	Rs.
1929-30	26,675	1,79,266	53,379
Average	27,078	1,89,552	54,366

CENTRAL CIRCLE.

SHOLAPUR DIVISION.

WADSHIVNE TANK.

110. On 1st April, the level of water in the tank was 14·49 feet over [illegible]ill of the outlet. The level gradually fell to 12·24 feet on 15th June. [illegible]he replenishments received in June, September and October the [illegible]e to 16·4 feet on 6th October. The storage was fully utilised [illegible]e kharif and rabi seasons. The mean rainfall gauged at two [illegible]he catchment area of the tank (14·5 square miles) was 15·47 [illegible]st 27·45 inches of the past year, and total replenishment [illegible]05·78 million cubic feet. The area irrigated was 1,135 [illegible] acres, the average of the last triennium. The increase [illegible]r demand for water both in the kharif and rabi seasons. [illegible]amounted to Rs. 5,577 against Rs. 3,306, the average [illegible]m. The expenditure on maintenance and repairs [illegible]Rs. 1,370, the average of the past three years.

AHMEDNAGAR DIVISION.

VISAPUR TANK.

111. The Visapur tank dam across the Hanga river, a tributary of the Bhima, was started as a famine relief work in 1896 and was subsequently completed by slow stages to provide employment for Criminal Tribes labour and to convict labour supplemented by free labour. This earthen dam which is 7,440 feet long and 84 feet high over the river bed forms a lake of 1,136 million cubic feet capacity and was completed in June 1927. Out of the estimated cost of Rs. 41 lakhs for the whole scheme, Rs. 21 lakhs have been spent on the dam and head-works and the balance has been spent on the construction of the canal, its distributaries and minors. The main canal with distributaries and minor channels is 46 miles long. The total area under command is 95,000 acres of which 26,000 acres are irrigable.

112. At the beginning of the monsoon the level of water in the tank was at R.L. 2,068 or 40 feet in height. The tank overflowed from 1st to 20th October. On 16th February, the level was at R.L. 2,061·27 or 32·77 feet in height. Water was issued for the first time for rabi crops during the year under report. The rainfall at Visapur was 15·93 inches. The area irrigated and the assessment were as under :—

	Area irrigated	Assessment
	Acres	Rs.
Kharif	13	88
Rabi	3,885	13,604

The above irrigation revenue was assessed at half the sanctioned rates which are to be levied for the first 3 years, a concession designed to popularize irrigation in this new tract. The revenue realised from other sources amounted to Rs. 2,614.

EAST KHANDESH DIVISION.

113. The area irrigated, revenue derived and the expenditure incurred on the following old works were :—

Name of work.	Area irrigated	Revenue		
		Irrigation share	Land share	Total
	Acres.	Rs.	Rs.	R
Patonda bandhara and channel ..	129	1,043	481	
Toli channel.	64	732	175	
Amalner bandhara and channel ..	371	2,854	1,151	
Total ..	564	4,629	1,8	

WEST KHANDESH DIVISION.

TALWADA TANK.

114. The supply in this tank is generally uncertain. On 1st April, there was no water in the tank. The first replenishment was received on 6th June, when the contents rose to 17·73 million cubic feet. The maximum storage during the year amounted to 104·77 million cubic feet on 13th July, and on 31st March the supply in the tank amounted to 30·29 million cubic feet. The rainfall gauged at Talwada was 17·57 inches against 14·93 inches of the previous year. There was no irrigation in the kharif season. The area irrigated in the rabi season was 425 acres and the assessment amounted to Rs. 1,959. The irrigation revenue realised amounted to Rs. 678 and the miscellaneous revenue to Rs. 20. The expenditure incurred on maintenance and repairs to the tank was Rs. 496.

OLD WORKS.

115. The area irrigated and the revenue derived from the old works were as shown below :—

Area irrigated	Revenue		
	Irrigation share	Land share	Total
Acres.	Rs.	Rs.	Rs.
8,024	47,420	9,963	57,383

No expenditure was incurred on repairs or improvements to these works during the year.

SATARA DIVISION.

BORGAON DAM.

116. The total area irrigated was 105 acres and the consolidated assessment was Rs. 563. The irrigation share of the revenue amounted to Rs. 338 and the balance of Rs. 225 represented the land assessment.

SOUTHERN CIRCLE.

DHARWAR DIVISION.

117. There are 9 second class irrigation tanks in this Division and the lands under them are assessed at consolidated rates. The total area irrigated and the irrigation share of land revenue were 470 acres and Rs. 1,660 respectively, the corresponding figures for the previous year being 444 acres and Rs. 1,681.

BELGAUM DIVISION.

118. The following are the details regarding the area irrigated by the second class irrigation tanks in this Division and the irrigation share of land revenue as compared with the previous year:—

Name of Collectorate	Number of tanks	Area irrigated		Irrigation share of land revenue	
		1929-30	1928-29	1929-30	1928-29
		Acres	Acres	Rs.	Rs.
Ratnagiri ..	4	1,273	1,273	7,400*	7,400*
Belgaum ..	2	25	25	56	93
Bijapur ..	4	636	634	2,162	2,163

* The whole revenue is shown as irrigation revenue until the exact amounts of land share and irrigation share are fixed by the new Record of Rights.

DHARWAR IRRIGATION DIVISION.

119. There are about 4,500 irrigation tanks in this Division, which comprises the Dharwar Collectorate and parts of Belgaum and Kanara Collectorates. Most of these tanks are formed by earthen dams without waste-weirs or regular outlets. Repairs were carried out to 153 of these tanks at a total cost of Rs. 64,523 and in addition Rs. 8,763 were spent on improvements. The area irrigated and the irrigation share of land revenue were 89,834 acres and Rs. 2,86,906 respectively against 91,937 acres and Rs. 3,09,735 of the previous year. The remissions granted during the year amounted to Rs. 26,978. The total receipts, direct and indirect, amounted to Rs. 2,95,231 and the working expenses to Rs. 1,35,270. The operations of the year showed a net profit of Rs. 1,59,961.

IRRIGATION DEVELOPMENT RESEARCH CIRCLE.

SPECIAL IRRIGATION DIVISION.

120. In the Deccan when a large perennial canal is opened, widespread water-logging is liable to ensue, due to percolation. Some of this water-logging dries out later, but the area of damage extends rapidly into the valleys, and unless steps are taken to set matters right, the later damage consisting mainly of salt-efflorescence becomes permanent. The seriousness of the menace was realised as early as 1888 and the controversy regarding the relative effect of channel losses and wasteful irrigation, and the best methods to adopt to safeguard the land, became yearly more acute. Various experiments were carried out at the instance of the Agricultural Department but by 1913 it was clear that all the methods tried had failed. It was eventually decided to open a Special Irrigation Division to investigate the question of canal development, especially as regards safeguarding the soil. In June 1916 the Division was formed and the work entrusted to it was "to contour the commanded area, make a careful survey and classification of the surface and sub-soil, select and

mark out definite areas suitable for 'blocks' for perennial and other crops, design the drainage required, indicate suitable lines of communication, and centres for the establishment of crushing, grinding, refining and other machinery for trade purposes, and to make a study of the reclamation of waste lands and areas damaged by water-logging and salt-efflorescence and the growth of useful timber in such tracts and along the main canal." In short, research and investigation into all the problems relating to irrigation by actual experiment has been the sphere of work of this Division. The investigations coming within this sphere may be broadly grouped under 5 heads, viz. (*a*) irrigation, (*b*) irriculture or the interaction of irrigation and agriculture, (*c*) soil physics, (*d*) drainage and reclamation and (*e*) hydrodynamic research. The results of the more important of these investigations are published in Technical Papers from time to time.

121. The work done in the Division during the year under report may be classified under (1) soil survey and classification, (2) observation of sub-soil water levels, (3) drainage of lands damaged by water-logging and salt-efflorescence, (4) formation and revision of blocks, (5) effluent irrigation, (6) irriculture at the Effluent Farm, (7) Baramati experimental salt area, (8) work of the Effluent Farm laboratory, (9) soil physical works, (10) river gauging, and (11) hydrodynamic research. A brief account of the work done during the year under these heads is given below :—

(1) *Soil survey and classification—Nira Right Bank Canal.*—Soil classification up to Branch No. 1 of this canal was completed during the year.

Nira Left Bank Canal.—A special soil survey for mapping the 1 foot and 1½ feet murum isobaths between Distributaries Nos. 6 and 22 is in progress.

Pravara and Godavari Canals.—Survey was done for the annual classification of damaged lands.

(2) *Observation of sub-soil water levels.*—Well-observation work is being carried out on the following Canals :—

(*a*) Godavari Canals.
(*b*) Pravara Canals.
(*c*) Nira Right Bank Canal.

The water levels on the Nira Left Bank Canal are also observed once a year. The results of these observations are of great use for ascertaining whether the sub-soil water level in any particular area is rising to within the danger limit and for deciding the suitability of lands for perennial blocks in the final soil classification.

(3) *Drainage of lands damaged by water-logging and salt-efflorescence.*—The following drainage schemes were sanctioned during the year under report :—

	Cost. Rs.
(*a*) Distributary 5 and 6 area of Nira Left Bank Canal.	49,919
(*b*) Douch Drainage Scheme Godavari Right Bank Canal.	26,985

	Cost. Rs.
(c) Loni Drainage Scheme Pravara Left Bank Canal ..	61,222
(d) Deolali area Drainage Scheme Pravara Right Bank Canal. ..	56,973
(e) Culvert 29 Drainage Scheme Godavari Right Bank Canal.	72,112

The drainage schemes under execution and the expenditure incurred on them during the year were :—

	Rs.
Nira Left Bank Canal	
Hol Murum Karanja scheme	15,696
Malegaon scheme	400
Distributary 26-C scheme	1,293
Godavari Canals	
Kopargaon scheme	1,078
Nimgaon Shirdi scheme	7,496
Pravara Canals	
Nandur Khandala scheme	11,452
Mutha Right Bank Canal	
Manjri scheme	1,631
Total ..	39,046

The total expenditure on drainage works during the year amounted to Rs. 39,046 against Rs. 48,515 of the preceding year. Besides, a number of schemes are under preparation. A Technical Paper on " Land drainage in the Deccan canal area " dealing with preparation, execution and maintenance of drainage schemes is being edited.

(4) *Blocks—formation and revision.*—The following table shows the areas applied for in blocks and those sanctioned on the various canals during the year :—

Serial No.	Name of Canal	Area applied for	Sanctioned		Remarks
			Proportion of cane	Area	
1	2	3	4	5	6
		Acres		Acres. Gun.	
1	Nira Right Bank Canal ..	1,008	1 : 4	660 0	1929-30 was the first year when this canal was opened for perennial irrigation. Cane was allowed on form No. 1 in 1929 when accompanied by block applications for 1930–36.

Serial No.	Name of canal	Area applied for	Sanctioned			Remarks
			Proportion of cane	Area		
1	2	3	4	5		6
		Acres		Acres	Gun.	
2	Nira Left Bank Canal ..	3,523	1 : 3	215	20	The current block period was to have ended on 14th February 1930. But for various reasons the period has been extended by one year.
			1 : 4	1,309	0	
				1,524	20	
3	Pravara Canals ..	2,749	1 : 3	463	20	In addition to this, the following areas were dealt with :—
			1 : 4	1,134	0	
				1,597	20	
						A. g.
						Conversion of 1 : 3 into 1 : 4 blocks 172 0
					"	Transfers 783 0
						Exchanges 263 20
4	Godavari Canals ..	1,274	1 : 3	201	0	
			1 : 4	488	0	
				689	0	
	Total ..	8,554	1 : 3	880	0	
			1 : 4	3,597	0	
				4,477	0	

(5) *Effluent Irrigation.*—The disposal of Poona sewage by mixing it with canal water and using the mixture for irrigation was started on Distributary No. 5 of the Mutha Right Bank Canal in 1916 and has been very successful. The most important feature of the year's working of effluent irrigation was the completion of a new pumping plant at Bahiroba Nala and consequent extension of the area under effluent. The extension of effluent irrigation necessitated a new rising main from the Bahiroba-Nala pumping station to the head of Distributary No. 5, a gravity Hume pipe line from Distributary No. 5 to Distributary No. 6 and the intervening outlets and similarly to Distributary No. 4 in the opposite direction. Distributary No. 3 is to be connected up by a branch rising main taking off from the rising main near the Pumping Station. These works have been carried out by the Poona Drainage Construction Division, and include an enlarged distributing chamber at Distributary No. 5, mixing chambers at the heads of outlets and distributaries and other connected works. This new pumping plant was put into use from 6th August.

The average discharge of effluent pumped and utilised during the year was 1·83 cusecs with an average strength of 4·08 parts of nitrogen in 100,000 parts of effluent by weight. The area under effluent irrigation during the year was 433 acres and the gross revenue therefrom amounted

to Rs. 43,209. The average discharge of canal water utilised to dilute the effluent was 8·16 cusecs and the total revenue due to this water amounted to Rs. 30,702.

(6) *Irriculture at the Effluent Farm.*—In 1918 an Experimental Farm was opened on Distributary No. 5 of the Mutha Right Bank Canal to investigate questions arising out of effluent irrigation, such as the best dose of effluent, the value of effluent per lb. of nitrogen, its effect on the soil, etc. Experiments on the relationship between the quantity of water applied and the outturn, and the effect of various periods between waterings and delayed waterings have also been under investigation. The Farm is now largely concerned with irricultural investigations, i.e. the interaction of irrigation and agriculture, the aim of the investigations being to modify agricultural methods to fit in with irrigation limitations and to mould irrigation practice to meet agricultural requirements. The following experiments were continued during the year under report :—

(*a*) Dose experiments.
(*b*) Coarse manure series.
(*c*) Varieties.
(*d*) Interval experiments :—
  (*i*) 8, 10, 12, 15 days interval throughout the year,
  (*ii*) regular and irregular rotations,
  (*iii*) 8 days in hot weather and 12 days for the rest of the year.
(*e*) Water quantity experiments.
(*f*) Water-cum-manure experiments.
(*g*) Seasonal plantation.
(*h*) Treble green manuring.

(7) *Baramati experimental salt area.*—The Baramati experimental salt area on the Nira Left Bank Canal was at the time of acquisition in 1921 of the worst type, the soil being highly salt-affected and extremely bad as regards its physical condition. It was acquired as an experimental measure to investigate methods of reclamation. The total area acquired is 161 acres. Of these 106 acres have been nearly reclaimed and are under cultivation ; and 21 acres and 26 gunthas are under Babul trees—a natural method of reclamation. The reclamation of the remaining area is in progress. The actual expenditure on this Baramati Farm during the year was Rs. 19,372 and the actual revenue derived therefrom amounted to Rs. 12,824, the latter showing an increase of Rs. 2,300 over the revenue of the previous year.

The system of reclamation by agricultural methods is as follows :—

(*a*) Flooding with protection of shallow trenches, i.e. leaching out salts.
(*b*) Growing a test crop of Shalu after flooding.
(*c*) Growing a San green manure crop during the monsoon after flooding.
(*d*) Addition of organic manures to improve the physical condition of soil.

The above is a comparatively simple though lengthy process which any intelligent cultivator can adopt.

(8) *Work of the Effluent Farm Laboratory.*—This work is mainly concerned with effluent in order that analyses may be recorded, that each cultivator may be given his proper quantity of nitrogen, and that other factors may be investigated. Other miscellaneous work done at the Laboratory consisted of—

(*a*) Finding out moisture contents in soil by a Megger Earth Tester.
(*b*) Transpiration experiments showing quantity of water taken up by plants up to full growth.
(*c*) Obtaining brix readings of cane planted on the farm.
(*d*) Mechanical analysis of silt.

(9) *Soil Physical Works.*—The work done during the year consisted of investigations of important factors affecting irrigation in the Deccan, viz. soil suitability of crops, improvement of soil in damaged lands by leaching or chemical fertilisers, aquatic weeds, etc.

(10) *River Gauging.*—The gauging of the river Mula at Chikalthan was continued during the year. From the river gauge record, the relation between rainfall and run-off has been worked out and the maximum flood curve ascertained. This information has already been published in Technical Paper No. 30, " A critical study of run-off and floods of catchments of the Bombay Presidency with a short note on losses from lakes by evaporation ".

(11) *Hydrodynamic Research at Distributary No. 5.*—Experiments in connection with the following subjects were continued during the year :—

I. Silt control.
II. Syphon—
  (*i*) 3·6′ concrete syphon,
  (*ii*) syphon with removeable top, and
  (*iii*) syphon at Khadakwasla.
III. Gibb Module—
  (*i*) 0·3 cusec Gibb Modules,
  and
  (*ii*) 3 cusec Gibb Module.

122. The work carried out has shown that the secret of Deccan irrigation is to use water and manure in very much smaller quantities than has been the practice. It has, in fact, been shown that heavy crops far superior to those grown by the cultivators can be obtained by using little more than half the manure and half the water normally applied and that when this is done, the physical state of the soil is conserved and improved, instead of being damaged, which hitherto caused a continuous falling off in returns.

123. A class for irrigation officers was again held during the monsoon of 1929 at which lectures and demonstrations of the work done in the division were given by the staff to 12 officers (including three from Sind) and five students and candidates.

STATEMENT I-E

STATEMENT

Statement of Area irrigated by Irrigation Works in the Bombay

No.	Name of work.	Area irrigated.					Double cropped	
		Kharif.	Rabi.	Total	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	PRODUCTIVE.							
	Southern Circle.							
1	Gadikeri Tank	*407	..	*407	407	..	..	..
2	Mavinkop Tank	*415	..	*415	415	..	..	..
	Central Circle.							
3	Shahada Channel	209 *451	407 *535	616 *986	1,602	..	168	10·40
	Total, Productive ..	209 *1,273	407 *535	616 *1,808	2,424	..	168	6·93
	UNPRODUCTIVE.							
	Northern Circle.							
4	Hathmati and Khari Cut Canals ..	†506 §2,054	408 626	914 2,660	895 2,159	19 501	..	..
5	Wangroli Tank	1,686	129	1,815	1,697	118	..	..
6	Savli Tank	1,665	..	1,665	1,663	2	..	..
7	Saiat Tank	1,186	50	1,236	1,235	1	..	..
8	Tranza-Nagrama Tanks	..	..	..	..	..	..	..
9	Futelao Tank	22	9	31	31	..	..	..
	Irrigation Development and Research Circle.							
10	Nira Left Bank Canal ..	(29,455) 39,862	(45,870) 25,302	65,164	64,802	362	6,944	10·66
	Shetphal Tank	(4,423) 4,761	(4,334) 2,040	6,801	6,801	..	1,359	19·98
	Deccan Irrigation Circle							
11	Nira Right Bank Canal	(3,462) 3,645	(11,518) 12,501	16,146	16,141	5	39	0·24
12	Mhaswad Tank	(1,304) 1,553	(4,826) 5,373	6,926	6,926	..	..	..
13	Mutha Canals	(5,999) 10,062	(6,469) 1,628	1129 11,690	11,502	188	139	1·15
	Matoba Tank	(647) 680	(2,054) 2,108	2,788	2,788	..	8	0·29
14	Kasurdi Tank	(20) 21	(101) 108	129	129	..	2	1·55
15	Shirsuphal Tank	(470) 494	(808) 832	1,326	1,326	..	339	25·56
16	Bhadalwadi Tank	(130) 20	(1,219) 1,370	1,390	1,390	..	129	9·28

I-E.

Presidency, excluding Sind, during the year 1929-30.

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.			
								Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
..	..	..	..	..	..	..	..	16th January to 15th October.	16th October to 15th January.
0·06	0·04	0·06	..	4,917	..	4,917	..	Do.	Do.
4·30	8·00	4·30	8·00	153	118	153	118	15th June to 14th October.	15th October to 14th February.
..	..	..	..	..	..	..	..		
‡112	15	‡54	15	4	27	9	27	15th June to 15th November.	16th November to 14th February.
¶51	5	¶39	5	40	125	52	125		
89·82	2·55	89·82	2·55	19	51	19	51		
132·59	..	132·59	..	12	..	12	..		
75·56	..	75·56	..	16	..	16	..	15th June to 14th November.	15th November 14th February.
..	..	..	..	..	..	..	..		
7·44	0·44	7·44	0·44	3	20	3	20		
(*b*)430	(*b*)440	(*b*)363	(*b*)424	68	104	81	108	15th February to 14th October.	15th October to 14th February.
38	34	38	34	(*g*)116	(*g*)127	(*g*)116	(*g*)127		
239	404	(*f*)	(*f*)	14	29	(*f*)	(*f*)	15th February to 14th October.	15th October to 14th February.
22	84	22	84	(*e*)59	(*e*)57	(*e*)59	(*e*)57	Do.	Do.
150	138	(*h*)	(*h*)	40	47	(*h*)	(*h*)	Do	Do.
9	13	9	13	72	164	72	164	15th June to 14th October.	Do.
..	..	..	..	..	..	..	..	Do.	Do.
5	6	5	6	94	135	94	135	Do.	Do.
1	4	1	4	130	305	130	305	Do.	Do

(*j*)

STATEMENT

No.	Name of work.	Area irrigated					Double cropped.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*	Acres.	Acres.	Acres.	Acres	Acres.	Acres.	
	UNPRODUCTIVE—*contd.*							
	Deccan Irrigation Circle—contd.							
	Lake Beale—Darna Dam	246	177	423	..	423	..	..
17	Godavari Right Bank Canal ..	(8,321) 11,860	(8,751) 2,219	14,079	14,006	73	1,017	7·2
	Godavari Left Bank Canal	(5,142) 7,589	(6,812) 1,905	9,494	9,494	..	438	4·6
18	Pravara Right Bank Canal	(4,972) 6,264	(7,154) 4,758	11,022	11,021	1	663	6·0
	Pravara Left Bank Canal	(14,079) 17,259	(16,103) 8,749	26,008	25,946	62	620	2·3
19	Chankapur Tank—Girna Left Bank Canal	(806) 1,889	(1,069) 2,031	3,920	3,920	..	..	..
20	Kadwa River Works. Palkhed Canal ..	(473) 734	(664) 573	1,307	1,298	9	24	1·84
	Kadwa River Works. Ojhar-Tambat Canal	(278) 482	(320) 345	827	827	..	26	3·14
	Kadwa River Works. Wadali Canal ..	(329) 390	(513) 345	735	735	..	1	0·14
21	Parsul Tank	(689) 1,044	(161) 457	1,501	1,501	..	..	..
	Central Circle.							
22	Ekruk Tank	1,934	3,117	5,051	4,931	120	..	..
23	Koregaon Tank	26	544	570	562	8	..	..
24	Ashti Tank	1,598	3,103	4,701	4,694	7	..	..
25	Pathri Tank	109	1,039	1,148	1,096	52	..	..
26	Bhatodi Tank	282	361	·643	·621	22	..	..
27	Jamda Canals	761	851	1,612	1,612	..	..	..
28	Hartala Tank	140	36	176	176	..	..	..
29	Mhaswa Tank	79	585	664	664	..	..	..
30	Lower Panjhra River Works	271 *1,155	948 *125	1,219 *1,280	2,499	..	645	25·8
31	Krishna Canal	5,157	1,026	6,183	5,496	687	120	1·94
32	Revari Canal	156	806	962	959	3	..	..
33	Upper Man River Works	61	1,324	1,385	1,380	5	3	0·22
34	Yerla River Irrigation Works	1,778	4,583	6,361	6,293	68	..	..

I-E—*contd.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharit.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
..	..	..	..	..	..	..	..		
(*d*) 171	(*d*) 185	(*d*) 149	(*d*) 156	(*e*) 49	(*e*) 47	(*e*) 56	(*e*) 56	15th February to 14th October.	15th October to 14th February.
(*d*) 82	108	(*d*) 79	108	(*e*) 63	(*e*) 63	(*e*) 65	(*e*) 63		
(*d*) 69	(*d*) 90	(*d*) 63	(*d*) 86	(*e*) 72	(*e*) 79	(*e*) 79	(*e*) 83	Do.	Do.
(*d*) 270	(*d*) 316	(*d*) 237	(*d*) 293	(*e*) 52	(*e*) 51	(*e*) 59	(*e*) 55	Do.	Do.
45	48	45	48	18	22	18	22	15th June to 14th October.	Do.
19	26	19	26	(*m*) 25	26	25	26	Do.	Do.
6	10	6	10	46	32	46	32	Do.	Do.
3	5	3	5	110	103	110	103	Do.	Do.
3	(*n*)	3	(*n*)	230	..	230	..	Do.	Do.
12·73	16·52	7·40	10·78	152	267	261	410	15th February to 14th October.	15th October to 14th February.
0·32	3·30	0·32	3·30	81	173	81	173	Do.	Do.
6·79	19·55	6·79	19·55	235	171	235	171	Do.	Do.
0·30	6·86	0·30	6·86	363	168	363	168	Do.	Do.
0·50	0·83	0·50	0·83	544	705	544	705	15th June to 14th October.	Do.
26·89	47·74	26·89	47·74	28	24	28	24	15th February to 14th October.	Do.
0·13	0·32	0·13	0·32	104	118	104	118	Do.	Do.
0·54	6·52	0·54	6·52	145	89	145	89	Do.	Do.
1·37	10·55	1·37	10·55	1,041	101	1,041	101	15th June to 14th October.	15th October to 14th February.
45·94	80·56	45·94	80·56	124	45	124	45	16th February to 15th October.	16th October to 15th February.
0·79	1·09	0·79	1·09	175	726	175	726	Do.	Do.
0·64	2·46	0·64	2·46	80	468	80	468	Do.	Do.
4·78	47·48	4·78	47·48	323	86	323	86	Do.	Do.

STATEMENT

No.	Name of work.	Area irrigated					Double crop. ed.	
		Kharif.	Rabi.	Total.	Flow.	Lift.	Area irrigated.	Percentage of total area.
1	2	3	4	5	6	7	8	9
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
	UNPRODUCTIVE—*concld.*							
	Central Circle—contd.							
35	Chikhli Canal	290	220	510	498	12	9	1·76
36	Maini Tank	1,057	1,656	2,713	2,677	36	152	5·60
	Southern Circle.							
37	Muchkundi Tank	..	22	22	22	..	..	..
38	Gokak Canal, First Section and Storage Works.	6,863	4,574	11,437	11,005	432	..	..
39	Dambal Tank	21 *143	314 ..	335 *143	478	..	..	..
40	Medleri Tank	31	8	39	39	..	..	..
41	Madag Tank	257	211	468	468	..	..	..
42	Asundi Tank	34	46 *190	80 *190	266	4	..	..
43	Dharma Canal	496 *5,227	.. ..	496 *5,227	5,723	..	..	..
	Total, Unproductive ..	137,355 *6,525	99,417 *315	236,772 *6,840 ‖29	240,392	3,220	12,677	5·20
	Grand Total, Productive and Unproductive.	137,564 *7,798	99,824 *850	237,388 *8,648 ‖29	242,816	3,220	12,845	5·22

Note.—The bold figures in brackets represent areas actually irrigated during the respective seasons and the duties have during the rabi season are assessed in Kharif papers and *vice versa*. In the rabi season in addition to pure rabi crops the rabi areas.

Note by the Superintending Engineer, Central Circle :—

As perennial and eight months crops are irrigated during the rabi season, in order to obtain the figures of duty for the the rabi season are added to areas of rabi in column 4 and the total so obtained is divided by figures of rabi discharges

(*b*) The difference between the discharges "At head" and "utilized" is due to canal water having been let into

(*c*) Low duties are due to scattered nature of irrigation. There is no irrigation in the first few miles of each

(*d*) The difference between the discharges at head and utilized is due to water having been run to waste through

(*e*) The duties on the Godavari and Pravara canals are low due to higher proportion of perennial crops and also to

(*f*) The discharge utilized from the Nira Right Bank Canal was very small as more discharge was let down to keep

(*g*) The high duties on the Shetphal Tank are due to concentration of irrigation on a small channel.

(*h*) Figures of "utilized" discharge are not available as the quantity let into the Matoba tank could not be accurately

(*i*) The low duties are due to high proportion of perennial crops to the seasonal crops. Besides a large quantity purposes,

(*j*) There is generally no supply in the tanks in the hot weather season. Even during the monsoon and rabi seasons which the channels were in flow has therefore been taken for purposes of calculating average discharge and

(*m*) The low duties are due to scattered nature of irrigation and timely rain fall in the monsoon season and also

(*n*) There was no demand for water for rabi under the parsul tank.

* Area under consolidated assessment.

† Includes 61 acres of hot season.

‡ 58 cusecs were supplied to Khari Cut Canal through Bhojwa channel and Bokh feeder for irrigation.

§ Includes 6 acres for hot season.

¶12 Cusecs were sent down to Khari sluices from Bokh reservoir *via* Khari Cut Canal.

‖ This represents area indirectly irrigated by underground percolation from the Mutha Left Bank Canal,

I-E—*concld.*

Average discharges, cubic feet per second.				Area irrigated per cubic foot per second.				Base to which the duties of water are calculated.	
At Head.		Utilized.		Discharged at Head.		Utilized.		Kharif.	Rabi.
Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
10	11	12	13	14	15	16	17	18	19
				Acres.	Acres.	Acres.	Acres.		
6·28	620	6·28	6·20	39	30	39	30	16th February to 15th October.	16th October to 15th February.
4·99	6·62	4·99	6·62	189	223	189	223	... Do.	Do.
..	..	..	..	..	..	..	..	15th February to 14th October.	15th October to 14th February.
24·48	40·77	24·48	40·77	280	112	280	112	Do.	Do.
1·60	7·45	1·60	7·45	103	41	103	41	16th January to 15th October.	16th October to 15th January.
2·88	4·71	2·88	4·71	11	2	11	2	Do.	Do.
7·97	14·73	7·97	14·73	32	14	32	14	Do.	Do.
1·98	4·44	1·98	4·44	17	53	17	53	Do.	Do.
93·74	43·91	93·74	43·91	61	..	61	..	Do.	Do.
..	..	..	..	..	..	..	..		
..	..	..	..	..	..	..	..		

been calculated on these figures. They differ from those in Statement IV-E owing to the fact that certain areas irrigated perennial and eight months crops are irrigated. To obtain correct duties therefore these crops have to be added to

rabi season in columns 15 and 17 the areas of perennial and eight months crops given in Statement "G" irrigated in in columns 11 and 13. The figures in columns 15 and 17 thus represent areas actually irrigated per cusec.

Shetphal tank and run to waste through scouring sluices.

distributary and branch of the Mhaswad Canal.

escapes.

scattered irrigation.

a mihimum depth of water for a better draw-off in the distributaries and surplus water was let off at escapes.

measured.

of water was supplied for drinking and domestic purposes to the Poona City and Cantonment and also for industrial

the channels are closed for days together due to rainfall and other causes. The actual number of days on duties.

to the strike of the irrigators resulting in no demand for water in the rabi season.

STATEMENT I-F.

Statement showing water-rates per acre in force during 1929-30 on Irrigation Works in the Bombay Presidency excluding Sind.

No.	Name of Work.	WATER-RATES. Irrigation in blocks.	Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	PRODUCTIVE.											
	Southern Circle.											
1	Gadikeri Tank * ..	..	..	..	..	..	..	..	..			
2	Mavinkop Tank * ..	..	..	..	..	..	..	..	..			
	Central Circle.											
3	Shahada Channel a ..	..	a^{14}	7½	2½	5	7½	..	a^{11} 1½ **2½	*Nil.*	*Nil.*	*Nil.*
	UNPRODUCTIVE.											
	Northern Circle.											
4	Hathmati Canal a^1 ..	..	(b^4)	..	D 3 E 1	3	6	..	2			
	Khari Cut Canal a^1 ..	..	(b^4)	..	D 7 E 1	5	6	..	1 **2			
5	Wangroli Tank a^2 ..	..	(b^4)	6½	D 5 E 2½	4	6	..	1½			
6	Savli Tank a^4 ..	..	(b^4)	8	4	4	6	..	1			
7	Saiat Tank a^5 ..	..	(b^4)	6½	D 4 E 2½	4	6	..	1½			
8	Tranza Nagrama Tanks. a^9	..	(b^4)	6	D 4 E 2	4	6	..	1			
9	Futelao Tank a^6 ..	..	(b^4)	..	D 4 E 2	a^7 3 a^8 2	Provisional 8	..	a^9 1	*Nil.*	*Nil.*	*Nil.*
	Irrigation Development and Research Circle.											
10	Nira Left Bank Canal. Shetphal Tank (*d*) ..	§22 ¶19	M 45 C 66 B 33	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12	Light 10 Heavy 15	..	(*o*)2			
	Deccan Irrigation Circle.											
11	Nira Right Bank Canal (*d*).	¶19	M 45 C 66 B 33	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12	Light 10 Heavy 15	..	(*o*) 2			
12	Mhaswad Tank (*c*) Z .	..	A 42 B 21	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12	9	..	(*o*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept— *contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*contd.*											
	Deccan Irrigation Circle —contd.											
13	Mutha Canals and Matoba Tank (*d*)—											
	Sugarcane under the Mutha Canals within the Poona City and Suburban Municipal and Cantonment limits or within one mile of those limits.	..	(*i*) 50	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12	Light 10 Heavy 15	..	(*o*) 2			
	On all remaining land commanded by both the canals.	..	M 45							*Nil.*	*Nil.*	*Nil.*
	Pan gardens ..	..	C 66									
	Perennial crops other than sugarcane and pan gardens.	..	B 33									
	Matoba Tank ..	..	(*g*)									
14	Kasurdi Tank (*b*) ..	..	X	Light 10 Heavy 15	Light 3 Heavy 4½	Light 7 Heavy 10½	9	..	(*o*) 2			
15	Shirsuphal Tank (*b*)..	..	X	Light 10 Heavy 15	Light 3 Heavy 4½	Light 7 Heavy 10½	9	..	(*o*) 2	*Nil.*	*Nil.*	*Nil.*
16	Bhadalvadi Tank (*b*)..	..	X	Light 10 Heavy 15	Light 3 Heavy 4½	Light 7 Heavy 10½	9	..	(*o*) 2			
17	Godavari Right Bank Canal (*d*). / Godavari Left Bank Canal (*d*).	§22 ¶19	M 45 C 66 B 33	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12	Light 10 Heavy 15	..	(*o*) 2			
18	Pravara Canals (*d*) (*f*).	§22 ¶19	M 45 C 66 B 33	Light 12 Heavy 18	Light 4 Heavy 6	Light 8 Heavy 12	Light 10 Heavy 15	..	(*o*) 2			

STATEMENT I-F—*contd.*

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage
	Works for which Capital and Revenue Accounts are kept— *contd.*	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE—*concld*											
	Deccan Irrigation Circle —contd.											
19	Chankapur Tank— Girna Left Bank Canal (c).	..	A 42	Light 12	Light 4	Light 8	9	..	(o) 2			
			B 21	Heavy 18	Heavy 6	Heavy 12						
20	Kadwa River Works (c)—											
	Waghad Tank ..	..	A 42	Light 12	Light 4	Light 8	9	..	(o) 2	*Nil.*	*Nil.*	*Nil.*
	Palkhed Canal ..	..										
	Ojhar-Tambat Canal ..	..		Heavy	Heavy	Heavy						
	Wadali Canal ..	..	B 21	18	6	12						
21	Parsul Tank (c) ..	..	X	Light 10	Light 3	Light 7	9	..	(o) 2			
	Central Circle.			Heavy 15	Heavy 4½	Heavy 10½						
22	Ekruk Tank a^{13} ..	..	A 35 B 17½	8	3	5	7	..	1			
23	Koregaon Tank a^{13} ..	..	A 32 B 16	7	3	4	6	..	1			
24	Ashti Tank a^{13} ..	..	A 32 B 16	7	3	4	6	..	1			
25	Pathri Tank a^{13} ..	..	A 32 B 16	7	3	4	6	..	1			
26	Bhatodi Tank a^{18} ..	..	16	8	3	5	8	..	2			
27	Jamda Canals a^{16} ..	..	B 10 A 16	5 $a^{17}\delta$	2	3	5	..	a^{16}			
28	Hartala Tank a^{16} ..	..	B 9 A 12	5 $a^{17}7$	2	3	4	..	1			
29	Mhasva Tank a^{16} ..	..	B 9 A 12	5 $a^{17}7$	2	3	4	..	a^{16} 1			
30	Lower Panjhra River Works. a^{12}	..	A 30 B 15	8	3	5	7	..	1½ **3			
31	Krishna Canal a^{16} ..	..	A 32 B 16	8	3	5	8	..	a^{-6}			
32	Revari Canal a^{16} ..	..	A 24 B 12	6	2	4	6	..	a^{14}	*Nil.*	*Nil.*	*Nil.*
33	Upper Man River Works. a^{16}	..	A 24 B 12	6	2	4	6	..	a^{14}			
34	Yerla River Irrigation Works. a^{16}	..	A 26 B 13	6½	2	4½	6½	..	a^{14}			
35	Chikhli Canal a^{15} ..	..	A 24 B 12	6	2	4	6	..	a^{14}			
36	Maini Tank a^{16} ..	..	A 24 B 12	6	2	4	6	..	a^{11}			

STATEMENT I-F—*concld.*

No.	Name of Work.	Water-rates. Irrigation in blocks.	Perennial.	Early eight months.	Monsoon, four months.	Rabi, four months.	Hot weather.	Miscellaneous.	Single watering.	Occupier's rate.	Owner's rate.	Water advantage.
	Works for which Capital and Revenue Accounts are kept —*concld.*.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.			
	UNPRODUCTIVE —*concld.*							...				
	Southern Circle.											
37	Muchkundi Tank (*s*)..	..	8	4	1	1	4	..	1	*Nil.*	*Nil.*	*Nil.*
38	Gokak Canal, 1st Section and Storage Works. (*u*)	..	(b^1) 27½ (b^2) 20	10	4	6	15	..	1½			
39	Dambal Tank (*w*) ..	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
40	Medleri Tank (*w*) ..	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
41	Madag Tank (*w*) ..	..	(*x*) 12	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
42	Asundi Tank (*w*) ..	..	(*x*) 14	(*y*) 6 (*z*) 7½	(*m*) 4	(*n*) 4½	(*l*) 7	..	(*j*) 1 (*k*) 2			
43	Dharma Canal *a*[10] ..	..	..	..	4½	..	..	..	(*j*) 1 (*k*) 2			

NOTE.— (1) For lift irrigation in the Deccan irrigation and Irrigation Development and Research Circles full flow rates are charged—*vide* G. R. No. 1947 of 20th November 1923.

(2) For lift irrigation half the ordinary rates are charged in other circles.

(3) Double the ordinary rates are charged as penal rates for taking water without permission.

(4) Leakage or percolation rates are the same as ordinary rates.

(5) Water rates for non-irrigational purposes are charged at the rates sanctioned by Government in each case subject to the minimum rates fixed in G. R. No. 851, dated the 7th April 1924.

(6) Water rate of Rs. 2 per acre per watering given to those who are not regular irrigators or holders of rabi leases—*vide* G. Rs. Nos. A-1-1759 and A-1-2525, dated the 5th July 1906 and 3rd March 1910, respectively.

(7) A reserve rate of Rs. 3 per acre as a minimum rate has been sanctioned for lands let out for cultivation in the basin of Lake Beale—*vide* G. R. No. 2484, dated 12th June 1925.

* Lands wholly assessed at consolidated rates.

§ Block rate for blocks with 1:3 proportion of sugarcane calculated as per scale sanctioned in G. R. No. 8670, dated 15th January 1927.

¶ Block rate for blocks with 1:4 proportion of sugarcane calculated as per scale laid down in G. R. No. 1909/27, dated 22nd August 1928.

** For one or more waterings to mature crops for which no applications for irrigation throughout the season are previously submitted.

A—For sugarcane and pan gardens.

B—For perennial crops other than sugarcane.

C—With effect from 15th February 1928, for pan gardens for the whole year. If water is given for part of the year the charge will be on the basis of twice the heavy seasonal rate for the season concerned—*vide* G. R. No. 8670, dated 29th February 1928.

D—For rice.

E—For monsoon crops other than rice.

M—For Sugarcane.

X—For sugarcane and pan gardens double the sum of the seasonal rates for light type crops, for those seasons during which water is given, shall be charged, and for other perennial crops single seasonal rates for light type crops, when water is available.

Z—The Mhaswad Tank will be incorporated in the Nira Right Bank Canal system as soon as irrigation starts at the tank, when the rates sanctioned for the Nira Right Bank Canal will be enforced for all guaranteed irrigation on this

(*b*) Rates sanctioned in G. R. No. 9451, dated 5th January 1927, to be in force up to 14th October 1929. With effect from 15th October 1929 and up to 14th February 1932 the following rates sanctioned in G. R. No. 3423/27, dated 26th September 1929 will be levied :—

Rs. 3 per acre for monsoon crops (light and heavy type).
Rs. 5 per acre for two or more waterings for leased area in rabi season (light and heavy type).
Rs. 6 per acre for two or more waterings for areas outside leased area in rabi season (light and heavy type).
Rs. 8 per acre for two seasonal crops (light and heavy type), for leased area only.
Rs. 9 per acre for hot weather crops.

(*c*) Rates sanctioned in G. R. No. 9451 dated 5th January 1927 and are to be in force up to 14th February 1932.

(*d*) Rates for crops other than sugarcane and pan gardens are to remain in force up to 14th February 1932 and that for sugarcane up to 14th February 1932—*vide* G. Rs. Nos. 3952, dated 20th April 1926, 23rd October 1926, 17th March 1927, 13th July 1927, 10th March 1928 and 7th January 1929 and 2486/27 dated 8th February 1930 and G. M. No. 2486/27 I.B. dated 23rd December 1930.

(*f*) The block system was introduced with effect from 15th February 1928.

(*g*) For sugarcane the short term cane rates as per scale sanctioned in G. R. No. 8670, dated 13th January 1927 (which may be in force on major irrigation works), and for other perennials single heavy seasonal rates will be charged with effect from 15th February 1928.

(*i*) To be in force up to 14th February 1932—*vide* G. R. No. 9906, dated 31st January 1931.
(*j*) From 15th June to 15th October.
(*k*) From 16th October to 14th June.
(*l*) From 15th February to 15th June.
(*m*) From 15th June to 15th October or 15th July to 30th November.
(*n*) From 15th October to 15th February.
(*o*) Sanctioned in G. Rs. Nos. 6573, dated 8th January 1925 and 12th March 1925.
(*s*) In force up to 15th February 1932—*vide* G. R. No. 334, dated 17th June 1926.
(*v*) From 15th February 1927 to 14th February 1932—*vide* G. R. No. 6243, dated 7th February 1927.
(*w*) Rates sanctioned for the period of five years ending 31st March 1935—*vide* G. R. No. 6095, dated 22nd October 1924 and G. R. No. 3187/27, dated 22nd August 1929.
(*x*) For sugarcane, betel leaves, etc., for 12 months.
(*y*) For eight months from 15th June to 15th February.
(*z*) For eight months from 15th October to 15th June or 1st August to 31st March.

[a] Rates sanctioned in G. Rs. Nos. 836, dated 8th October 1923, 836, dated 23rd April 1924, 836, dated 29th July 1924, and 1590/27, dated 19th June 1928, are to be in force up to 14th February 1934.

[a1] Rates sanctioned in G.R. No. 4855, dated 23rd December 1927 are to be in force up to 14th February 1932.

[a2] Rates sanctioned in G. Rs. Nos. 825, dated 30th August 1924 and 825, dated 1st November 1926, are to be in force up to 15th June 1935—*vide* G. R. No. 2881/27 dated 4th July 1929.

[a3] Rates sanctioned in G. Rs. Nos. A-I-1128, dated 13th May 1910 and 679/27, dated 25th November 1927, are to be in force up to 31st July 1933.

[a4] Rates sanctioned in G. Rs. Nos. A-I-1335, dated 14th June 1910, 815, dated 18th February 1925 and 815, dated 13th November 1926, are to be in force up to 15th June 1935 excepting those for kharif rice and single watering which have been raised to Rs. 5 and Rs. 1½ respectively with effect from 16th June 1930—*vide* G. R. No. 2894/27, dated 19th June 1929.

[a6] Rates sanctioned in G. Rs. Nos. A-I-309, dated 15th February 1911, 5412, dated 15th December 1926 and 2835/27 dated 4th October 1929 are to be in force up to 15th June 1935.

[a6] Rates sanctioned in G. O. No. A-I-9945, dated 12th October 1917, are to be in force up to 31st March 1935—*vide* G. R. No. 2691/27, dated 29th April 1929.

[a7] For ordinary rabi.

[a8] For restorative crops grown after rice.

[a9] In either kharif or rabi season.

[a10] Rates sanctioned in G. R. No. 293/27 of 9th August 1927 to be in force up to 31st March 1932.

[a12] Rates sanctioned in G. R. No. 7736, dated 30th October 1925, are to be in force from 15th June 1926 to 14th February 1931.

[a13] Rates in force up to 15th February 1931—*vide* G. Rs. Nos. 6529, dated 17th January 1925, and 1912/27, dated 27th July 1928.

[a14] For sugarcane and pan gardens double the ordinary rates are charged.

[a15] In force up to 15th February 1932—*vide* G. O. No. A-I-16033, dated 8th December 1919, and G. R. No. 3151/27, dated 3rd January 1930.

[a16] Rates in force till 31st March 1931—*vide* G. R. No. 8096, dated 4th January 1926.

[a17] Water rate for late eight months, *i.e.*, from 15th October to 14th June.

[a18] Rates in force up to 14th October 1931—*vide* G. R. No 1501/27 of 15th February 1929. Rate for late eight months' crops during this period is Rs. 13.

(*b*[1]) Rate for perennial 12 months.
(*b*[2]) Rate for perennial 8 months.
(*b*[4]) Single seasonal rates are charged—*vide* G. R. No. 3343/27, dated 8th October 1929.

STATEMENT G

STATEMENT

Statement showing Areas and Water-rate Assessments in the Bombay of classification adopted in fixing

No.	Name of Work.	Perennial in blocks.		Perennial outside blocks.					
				Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.								
	PRODUCTIVE.								
	Southern Circle.								
1	Gadikeri Tank†	..	..	..	..	..	..	..	..
2	Mavinkop Tank †	..	..	..	..	..	..	..	..
	Central Circle.								
3	Shahada Channel	..	..	..	..	..	..	19	368
	Total, Productive ..	..	..	..	..	..	..	19	368
	Average rate ..	..	..	..	..	..	..	..	19·31
	UNPRODUCTIVE.								
	Northern Circle.								
4	Hathmati and Khari Cut Canals ..	..	..	..	..	..	..	..	..
5	Wangroli Tank	..	..	..	..	..	..	..	..
6	Savli Tank	..	..	..	..	..	..	..	..
7	Saint Tank	..	..	..	..	..	..	..	..
8	Tranza Narama Tanks ..	..	..	..	..	..	..	..	..
9	Futelao Tank	..	..	..	..	..	..	..	..
	Irrigation Development and Research Circle.								
10	Nira Left Bank Canal and Shetphal Tank	20,619	4,50,394	4,269	52,966	518	3,076	4,787	56,042
	Deccan Irrigation Circle.								
11	Nira Right Bank Canal	..	..	64	2,234	32	520	96	2,754
12	Mhaswad Tank	..	..	65	1,286	33	295	98	1,581
13	Mutha Canals	..	..	3,335‡	1,04,141‡	2,040	60,599	5,375	1,64,740
	Matoba Tank	..	..	329	5,512	95	1,568	424	7,080

*The classification of crops into "heavy" and "light" varieties has been introduced only in the

†The Area under these works is under consolidated assessment.

‡Details of perennials (heavy type) under the Mutha Canals :—

	Area.	Assessment
	Acres	Rs.
(1) Within the Poona City, Suburban and Cantonment limits or within one mile of these limits	555	17,798
(2) On the remaining land commanded by both the canals	2,769	85,998
(3) Pan gardens wherever situated throughout the canals	11	345
Total .	3,335	1,04,141

G.

Presidency, excluding Sind, during 1929-1930, according to the system the Scale of Water-rates.

Two Seasonal.						Monsoon—4 Months.					
Heavy.*		Light.*		Total.		Heavy.*		Light.*		Total.	
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	17	43
..	..	..	..	..	..	..	..	..	..	17	43
..	..	..	..	..	..	..	..	..	..	..	2·53
..	..	..	..	..	..	..	..	..	..	2,473	10,954
..	..	..	..	..	..	..	..	..	..	1,436	7,056
..	..	..	..	..	..	..	..	..	..	1,582	6,381
..	..	..	..	..	..	..	..	..	..	853	3,163
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
6,969	1,25,280	395	4,740	7,355	1,30,020	16	96	6,937	27,748	6,953	27,844
617	9,083	606	5,289	1,223	14,372	271	1,737	1,796	12,663	2,067	14,400
499	5,888	604	3,228	1,103	9,116	..	..	123	528	123	528
891	14,650	354	3,464	1,245	18,114	48	283	3,478	13,901	3,526	14,184
61	960	30	357	91	1,317	..	..	176	783	176	783

Deccan Irrigation and Irrigation Development and Research Circles.

STATEMENT

No.	Name of Work.	Rabi—4 Months.					
		Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.						
	PRODUCTIVE.						
	Southern Circle.						
1	Gadkeri Tank†	..	..	..	..	..	....
2	Mavinkop Tank†	..	..	..	..	..	....
	Central Circle.						
3	Shahada Channel	..	..	..	..	407	2,484
	Total Productive ..	..	..	..	..	407	2,484
	Average rate ..	..	..	..	..	..	6·10
	UNPRODUCTIVE.						
	Northern Circle.						
4	Hathmati & Khari Cut Canals ..	..	..	..	..	1,024	2,411
5	Wangroli Tank	..	..	..	..	129	475
6	Savli Tank	..	..	..	..	..	....
7	Saint Tank	..	..	..	..	50	198
8	Tranza Narama Tanks	..	..	..	..	..	....
9	Futelao Tank	..	..	..	..	9	28
	Irrigation Development and Research Circle.						
10	Nira Left Bank Canal & Shetphal Tank	1,526	18,312	22,360	1,78,880	23,886	1,97,192
	Deccan Irrigation Circle.						
11	Nira Right Bank Canal	382	4,515	11,697	94,998	12,079	99,513
12	Mhaswad Tank	160	2,311	4,515	42,507	4,675	44,818
13	Mutha Canals	19	234	1,050	9,886	1,069	10,120
	Matoba Tank.	142	1,701	1,941	16,138	2,083	17,839

*The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan Irrigation Circle. The area under these works is under consolidated assessment.

†Exclusive of 986 acres of Mamul Bagait area.

§An area of 29 acres was indirectly irrigated by underground percolation from the Mutha Left Bank Canal. The

(d) The column "Miscellaneous" represents areas sanctioned and surveyed but not irrigated as well as areas under cannot be properly classified.

G—*contd.*

Hot weather.						Miscellaneous. (*d*)		Grand Total	
Heavy.*		Light.*		Total.					
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..
..	..	..	..	48	419	125	324	616‡	3,638
..	..	..	..	48	419	125	324	616	3,638
..	..	..	..	..	8·72	..	2·59	..	5·90
..	..	..	..	67	149	..	..	3,574	13,514
..	..	..	..	250	1,075	..	..	1,815	8,606
..	..	..	..	83	466	..	..	1,665	6,847
	..	..	..	333	1,303	..	..	1,236	4,664
..	..	..	..	..	..	..	..	..	..
..	..	..	..	22	176	..	..	31	204
78	1,170	5,821	29,105	5,899	30,275	2,466	6,942	71,965	8,98,709
..	..	189	978	189	978	492	2,500	16,146	1,35,517
5	17	126	1,144	131	1,161	796	7,428	6,926	64,632
143	1 075	95	862	238	1,937	237	901	11,690	2,09,996
..	..	..	..	..	..	14	58	29§ 2,788	52§ 27,077

Irrigation and Irrigation Development and Research Circles.

Revenue derived therefrom was Rs. 52.
Penalties for waste of water, etc., and land insufficiently irrigated besides the areas of miscellaneous crops which

STATEMENT

No.	Name of Work.	Perennial in blocks.		Perennial outside blocks.					
				Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*								
	UNPRODUCTIVE—*contd.*								
	Deccan Irrigation Circle—contd.								
14	Kasurdi Tank	..	..	1	8	..	..	1	8
15	Shirsuphal Tank	..	..	2	81	76	461	78	542
16	Bhadalwadi Tank	..	..	..	..	..	..	..	..
17	Godavari Right Bank Canal ..	7,222	1,58,895	1,076	18,112	455	12,553	1,531	30,665
	Godavari Left Bank Canal ..	5,684	1,25,037	490	6,404	182	4,432	672	10,836
18	Pravara Right Bank Canal ..	2,574	56,628	415	4,958	462	12,886	877	17,854
	Pravara Left Bank Canal ..	7,014	1,54,308	5,834	1,21,478	589	16,926	6,423	1,38,404
19	Chankapur Tank—Girna Left Bank Canal	..	..	432	18,186	84	1,606	516	19,792
20	Kadwa River Works. Palkhed Canal ..	..	..	114	4,938	43	730	157	5,668
	Ojhar Tambat Canal..	..	..	69	3,268	44	734	113	4,002
	Wadali Canal ..	..	..	43	1,882	23	379	66	2,261
21	Parsul Tank	..	..	8	159	15	140	23	299
	Central Circle.								
22	Ekruk Tank	..	..	..	..	..	..	211	7,056
23	Koregaon Tank	..	..	..	..	..	..	..	..
24	Ashti Tank	..	..	..	..	..	..	81	1,972
25	Pathri Tank	..	..	..	..	..	..	..	..
26	Bhatodi Tank	..	..	..	..	..	..	..	..
27	Jamda Canals	..	..	..	..	..	..	159	2,048
28	Hartala Tank	..	..	..	..	..	..	..	..
29	Mhaswa Tank	..	..	..	..	..	..	1	9
30	Lower Panjhra River Works ..	..	..	..	..	..	..	162	2,4[illegible]4
31	Krishna Canal	..	..	..	..	..	..	1,581	14,207
32	Revari Canal	..	..	..	..	..	..	18.	[illegible]19
33	Upper Man River Works ..	..	..	..	..	..	..	21	380
34	Yerla River Irrigation Works ..	..	..	..	..	..	..	54	718
35	Chikhli Canal	..	..	..	..	..	..	37	681
36	Maini Tank	..	..	..	..	..	..	72	864
	Southern Circle.								
37	Muchkundi Tank	..	..	..	..	..	..	22	172

* The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

G—*contd.*

Two Seasonal.						Monsoon—4 months.					
Heavy.*		Light.*		Total.		Heavy.*		Light.*		Total.	
Area.	Assessment.	Area.	Assessment.	Area	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	21	63	21	63
41	332	212	1,253	253	1,585	..	..	189	571	189	571
1	5	68	327	69	332	..	..	9	26	9	26
132	2,431	13	156	145	2,587	2	9	1,989	8,038	1,991	8,047
24	434	74	888	98	1,322	15	88	599	2,430	614	2,518
18	324	..	..	18	324	10	63	1,578	6,459	1,588	6,522
17	324	2	24	19	348	77	462	3,658	14,880	3,735	15,342
74	714	3	41	77	755	9	56	204	844	213	900
291	9,187	..	..	291	9,187	3	26	22	103	25	129
131	5,510	..	..	131	5,510	..	..	34	160	34	160
190	3,672	..	..	190	3,672	14	128	59	234	73	362
24	248	..	..	24	248	..	..	642	1,934	642	1,934
..	..	..	..	1,093	9,461	..	..	..	..	70	299
..	..	..	..	26	180	..	..	..	..	..	..
..	..	..	..	1,169	8,183	..	..	..	..	122	366
..	..	..	..	109	774	..	..	..	..	..	..
..	..	..	..	246	1,789	..	..	..	..	36	249
..	..	..	..	147	804	..	..	..	..	145	324
..	..	..	..	2	13	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	30	290	..	..	..	..	10	43
..	..	..	..	1,765	13,887	..	..	..	..	1,642	5,009
..	..	..	..	39	214	..	..	..	..	26	100
..	..	..	..	4	12	..	..	..	..	30	250
..	..	..	..	64	329	..	..	..	..	1,687	3,498
..	..	..	..	88	480	..	..	..	..	162	363
..	..	..	..	12	72	..	..	..	..	339	676
..	..	..	..	..	..	..	..	..	..	..	..

*Irrigation and Irrigation Development and Research Circles.

STATEMENT

No.	Name of Work.	Rabi—4 Months.					
		Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*contd.*						
	UNPRODUCTIVE—*contd.*						
	Deccan Irrigation Circle—contd.						
14	Kasurdi Tank	2	12	105	546	107	558
15	Shirsuphal Tank	86	433	704	3,865	790	4,298
16	Bhadalwadi Tank	62	312	1,208	6,218	1,270	6,530
17	Godavari Right Bank Canal ..	94	1,130	1,711	14,393	1,805	15,523
	Godavari Left Bank Canal ..	28	336	1,517	12,751	1,545	13,087
18	Pravara Right Bank Canal ..	10	120	4,499	38,485	4,509	38,605
	Pravara Left Bank Canal ..	61	744	5,899	52,032	5,960	52,776
19	Chankapar Tank—Girna Left Bank Canal	27	245	449	2,209	476	2,454
20	Kadwa River Works. Palkhed Canal ..	53	635	163	1,297	216	1,932
	Kadwa River Works. Ojhar Tambat Canal ..	20	231	56	437	76	668
	Kadwa River Works. Wadali Canal ..	124	1,375	133	1,065	257	2,440
21	Parsul Tank	..	..	114	367	114	367
	Central Circle.						
22	Ekruk Tank	..	..	..	..	1,726	8,631
23	Koregaon Tank	..	..	..	..	544	2,461
24	Ashti Tank	..	..	..	..	2,837	11,348
25	Pathri Tank	..	..	..	..	1,039	4,520
26	Bhatodi Tank	..	..	..	..	361	1,777
27	Jamda Canals	..	..	..	..	798	2,598
28	Hartala Tank	..	..	..	..	37	110
29	Mhaswa Tank	..	..	..	..	585	1,885
30	Lower Panjhra River Works ..	..	..	..	..	945	5,239
31	Krishna Canal	..	..	..	..	915	5,046
32	Revari Canal	..	..	..	..	794	3,550
33	Upper Man River Works ..	..	..	..	..	1,229	5,159
34	Yerla River Irrigation Works ..	..	..	..	..	4,548	22,230
35	Chikhli Canal	..	..	..	..	198	840
36	Maini Tank	..	..	..	..	2,256	8,194
	Southern Circle.						
37	Muchkundi Tank	..	..	..	..	..	....

*The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

†This represents areas in the basin of Lake Beale let out for cultivation and the assessment charged thereon.

‡Exclusive of 1,280 acres of Mamul Bagait area.

§Exclusive of Rs. 6,920 on account of enhanced water rates on old works.

(d) The column "Miscellaneous" represents areas sanctioned and assessed but not irrigated as well as areas under b properly included.

G—*contd.*

Hot weather.						Miscellaneous (*d*)		Grand Total.	
Heavy.*		Light.*		Total.					
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	..	..	..	..	129	629
..	..	2	22	2	22	14	56	1,326	7,074
..	..	..	..	..	..	42	167	1,390	7,055
..	..	283	2,827	283	2,827	423†	1,558†	423†	1,558†
						1,102	8,724	14,079	2,27,268
..	..	176	1,855	176	1,955	705	4,274	9,494	1,58,929
13	195	72	720	85	915	1,371	4,874	11,022	1,25,722
11	173	148	1,575	159	1,748	2,698	23,380	26,008	3,86,306
..	..	67	561	67	561	2,571	18,728	3,920	43,190
..	..	26	217	26	217	592	1,856	1,307	18,989
..	..	7	65	7	65	466	1,096	827	11,501
..	..	41	382	41	382	108	557	735	9,674
..	..	23	195	23	195	675	14,164	1,501	7,207
..	..	..	..	405	2,825	1,546	8,860	5,051	37,052
..	..	..	..	..	..	..	..	570	2,641
..	..	..	..	122	732	370	4,065	4,701	26,666
..	..	..	..	..	..	..	..	1,148	5,294
..	..	..	..	..	..	..	..	643	3,815
..	..	..	..	52	279	311	535	1,612	6,588
..	..	..	..	..	..	137	247	176	370
..	..	..	..	1	4	77	81	664	1,979
..	..	..	..	39	272	33	71	1,219‡	9,369§
..	..	..	..	27	138	253	2,327	6,183	70,614
..	..	..	..	54	378	1	1	962	5,162
..	..	..	..	99	244	2	14	1,385	6,059
..	..	..	..	6	49	2	4	6,361	26,828
..	..	..	..	22	96	3	17	519	2,477
..	..	..	..	..	..	34	107	2,713	9,915
..	..	..	..	..	..	..	..	22	172

Irrigation and Irrigation Development and Research Circles.
These areas cannot be classified in respect of different crops.

penalties for wastage of water, etc. and land insufficiently irrigated besides the areas of miscellaneous crops which cannot

STATEMENT

No.	Name of Work.	Perennial in blocks.		Perennial outside blocks.					
				Heavy*		Light*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*								
	UNPRODUCTIVE—*concld.*								
	Southern Circle—contd.								
38	Gokak Canal 1st Section and Storage Works	..	..	..	..	..	..	102	1,920
39	Dambal Tank	..	..	..	..	..	..	5	80
40	Medieri Tank	..	..	..	..	..	..	29	424
41	Madag Tank	..	..	..	..	..	..	26	299
42	Arundi Tank	..	..	..	..	..	..	4	25
43	Dharma Canal	..	..	..	..	..	..	..	..
	Total, Unproductive ..	43,113	9,45,262	16,546	3,45,623	4,691	1,16,805	23,852	5,26,766
	Average rate ..		21·92		20·89		24·90		22·08
	Grand Total ..	43,113	9,45,262	16,546	3,45,623	4,691	1,16,805	23,871	5,27,134
	Average rate ..		21·92		20·89		24·90		22·08

*The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

Note—The difference between the figures of total areas and assessments in this Statement and those in the fact that the figures in this Statement are more or less hypothetical and are arrived at on

C—concld.

Two Seasonal.						Monsoon—4 Months.					
Heavy.*		Light.*		Total.		Heavy.*		Light.*		Total.	
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	2,537	29,322	..	..	..	..	3,628	16,719
..	..	..	..	..	..	..	..	..	..	16	61
..	..	..	..	..	..	..	..	..	..	2	11
..	..	..	..	21	157	..	..	..	..	246	1,010
..	..	..	..	76	577	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	496	3,276
9,971	1,79,042	2,361	19,767	19,760	2,65,343	465	2,948	21,514	91,365	36,980	1,54,033
	17·95		8·37		13·43		6·34		4·24		4·17
9,971	1,79,042	2,361	19,767	19,760	2,65,343	465	2,948	21,514	91,365	36,997	1,54,076
	17·95		8·37		13·43		6·34		4·24		4·16

Irrigation and Irrigation Development and Research Circles.

statements I—E to IV—E is due to difference in treatment of fractions in some cases, and in others to the assumption that certain areas are assessed at certain rates.

STATEMENT

No.	Name of Work.	Rabi—4 Months.					
		Heavy.*		Light.*		Total.	
		Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
		Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
	WORKS FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT—*concld.*						
	UNPRODUCTIVE—*concld.*						
	Southern Circle.—concld.						
38	Gokak Canal 1st Section and storage Works	..	..	..	..	4,522	27,763
39	Dambal Tank	..	..	..	..	314	1,465
40	Medleri Tank	..	..	..	..	8	35
41	Madag Tank	..	..	..	..	475	790
42	Asundi Tank	..	..	..	..	..	....
43	Dharma Canal	..	..	..	..	..	....
	Total Unproductive ..	2,796	32,646	58,121	4,76,074	85,970	6,25,473
	Average rate ..		11·67		8·19		7·27
	Grand Total ..	2,796	32,646	58 121	4,76,074	86,377	6,27,957
	Average rate ..		11·67		8·19		7·27

*The classification of crops into "heavy" and "light" varieties has been introduced only in the Deccan

Note.—The difference between the figures of total areas and assessments in this Statement and those in Statements in this Statement are more or less hypothetical and are arrived at on the assumption that certain areas are

†The column "Miscellaneous" represents areas sanctioned and assessed but not irrigated as well as areas under be properly classified.

‡An area of 29 acres was indirectly irrigated by under-ground percolation from the Mutha Left Bank Canal. The

G—concld.

Hot weather						Miscellaneous.†		Grand Total.	
Heavy*.		Light.*		Total.					
Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.	Area.	Assessment.
Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.	Acres.	Rs.
..	..	..	..	185	1,566	463	1,049	11,437	78,339
..	..	..	..	..	..	..	..	335	1,606
..	..	..	..	..	..	..	..	39	470
..	..	..	..	..	..	..	..	468	2,256
..	..	..	..	..	..	..	..	80	602
..	..	..	..	..	..	..	..	496	3,276
250	2,630	7,076	40,508	9,093	52,900	18,004	1,05,641	2,36,772 ‡29	26,25,418 ‡52
	10·52		5·72		5·82		5·87		11·29
250	2,630	7,076	40,508	9,141	53,319	18,129	1,05,965	2,37,388 ‡29	26,79,056 ‡52
	10·52		5·72		5·83		5·85		11·29

Irrigation and Irrigation Development and Research Circles.

I—E to IV—E is due to difference in treatment of fractions in some cases, and in others to the fact that the figures assessed at certain rates.

penalties for waste of water, etc., and land insufficiently irrigated besides the areas of miscellaneous crops which cannot

revenue derived thereform was Rs. 52.

Administration Report of Irrigation Works in the Deccan and Gujarat for 1929-30 : Review of —

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. P. 22/4103.

Bombay Castle, 16th March 1931.

RESOLUTION OF GOVERNMENT.

This is the first Report to be prepared on new lines in accordance with the orders issued in Government Resolution No. 2209/27, dated 21st November 1929, in which it was directed that the three annual publications issued by the Irrigation Department (viz. the Irrigation Administration Report, the Irrigation Revenue Report for Deccan and Gujarat and the Irrigation Revenue Report for Sind) should be amalgamated and issued in three parts as under :—

(*i*) Irrigation Administration Report, Part I—Deccan and Gujarat.
(*ii*) Irrigation Administration Report, Part II—Sind.
(*iii*) Irrigation Administration Report, Part III—Administrative accounts and statistical statements.

2. The irrigation works dealt with in this Report which covers the period 1st April 1929 to 31st March 1930 fall under two categories, viz. (*i*) tanks and canals for which capital and revenue accounts are kept and (*ii*) small tanks, bandharas and drainage channels for which neither capital nor revenue accounts are kept. The works included under (*i*) are described in detail in Section I of the Report. The works mentioned under (*ii*) are small and numerous and a brief account of them is given in Section II.

3. The total capital outlay on the works for which capital and revenue accounts are kept, up to the end of the year under review, amounted to Rs. 10,25,09,061.

4. Including an area of 8,648 acres on which a consolidated water and land assessment was levied, the area irrigated was 246,036 acres as compared with 231,544 acres in the previous year.

5. The gross assessed revenue amounted to Rs. 31,63,392 against Rs. 31,59,294 of the previous year and Rs. 34,10,880 the average of the past three years.

6. The unrealised balance at the close of the year amounted to Rs. 16,82,756. A portion of this amount has since been recovered and steps have been taken to recover the balance still outstanding.

7. The working expenses amounted to Rs. 17,13,434 as compared with Rs. 17,99,486 in the previous year.

8. The net revenue after deducting working expenses amounted to—

		Rs.
(*i*) On the basis of assessment	..	14,49,958
(*ii*) On the basis of realisation	..	13,15,918

as compared with Rs. 13,59,808 and Rs. 14,98,277 respectively of the previous year.

9. The statement embodied in paragraph 15 of the Report shows the financial results of the more important irrigation works in operation.

10. The total area irrigated by works for which neither capital nor revenue accounts are kept was 159,159 acres and the gross revenue obtained was Rs. 6,92,640. The total expenditure incurred on improvements and repairs to these works amounted to Rs. 7,13,421.

By order of the Governor in Council,

T. A. ANDREW,
Deputy Secretary to Government.

To

The Finance Department.
The Revenue Department.
The Commissioner in Sind.
The Commissioner, Northern Division.
The Commissioner, Central Division.
The Commissioner, Southern Division.
The Settlement Commissioner and Director of Land Records.
The Director of Agriculture.
The Director of Information.
The Chief Engineer, Lloyd Barrage and Canals Construction.
The Chief Engineer in Sind.
All Superintending Engineers of Circles.
All Collectors in the Presidency proper (except those of Bombay, Bombay Suburban, Thana and Kolaba).
The Accountant General, Bombay.
The Executive Engineers in charge of Irrigation Works in the Deccan and Gujarat.
The Secretary to the High Commissioner for India (by letter).

BOMBAY: PRINTED AT THE BOMBAY GOVERNMENT CENTRAL PRESS.

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MAP OF DECCAN & GUJARAT

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT

Part I—DECCAN & GUJARAT, 1929—30.

SCALE 40 MILES TO AN INCH.

AHMEDABAD DIVISION.

AHMEDABAD DISTRICT

Works in Operation.

1. Sabarmati Canal
2. Kankri Reservoir
3. Feeder Dediapan Drainage
4. Vasantpur Drainage
5. Kharicut Drainage
6. Gheekanta Tank
7. Ogan Drain
8. Gotharia Group Drain
9. Khari Siphon
10. Gokhriy Tank
11. Gadri Tank
12. Narol Reservoir
13. Nalka Reservoir at Chanlodia
14. Chandola Drain
15. Khari Cut
16. Chandola Tank
17. Vasna Tank
18. Sabarmati & Western Drainage at Dholka

KAIRA DISTRICT

KAIRA & PANCH MAHALS DIVISION.

I (KAIRA.)

Works in Operation.

1. Mahur Drain
2. Vatrak Tank
3. Vagrosar Tank
4. Added Mogri Drain
5. Kanewadi Drain
6. Saint Tank
7. Kapda Tank
8. Wanganli Tank
9. Dudhal Tank
10. Narwal Tank
11. Tarapur Canal Drain

Incomplete Work.

12. Mordadar Tank
13. Gunsinga Tank
14. Mortadi Tank
15. Mahelav Tank
16. Rahee Tank
17. Sukhar Tank
18. Dangarva Tank
19. Sevlee Tank
20. Shershikra Anicit Tank
21. Penta Tank

II (PANCH MAHALS.)

Works in Operation.

22. Kanoda Tank
23. Ghoda Tank
24. Gamdi Tank
25. Kanjeta Wandali Tank
26. Kalan Tanka
27. Sukh Sirur Project.
28. Morad Super Tank

Incomplete Work.

29. Pavaj Tank
30. Kevdna Tank

SURAT & BROACH DIVISION.

I (BROACH.)

Works in Operation.

1. Kara-Mahajan Junction Drainage Channel
2. Nabarmia Drainage Channel
3. Kundlaura-Hathi Drainage Channel
4. Amarpur-Nadiad Drainage Channel
5. Northern Drainage Channel
6. Ahmedpur-Dias Canal
7. Mahi Channel near Tokar
8. Kirtan Sinh Drainage Chnl.
9. Kanjari-Kanjari Chnl. &c.
10. Gokuj Dudhi and Dedarwada Minor Channel
11. Somalpura Paraiya Channel
12. Pankaura-Added Channel
13. Sindrin-Added Channel
14. Jalva Channel

Works in Operation.

15. Mordhan Channel
16. Orsa-Vitthal Babajipur Drainage Channel
17. Kalwal Channel
18. Waghrara Drainage Channel
19. Wadi Channel
20. Adul Rajat Channel
21. Amrut Nagar
22. Amreta Subvention Band
23. Dumas Tank
24. Pandoli-Sur Road at Kakodra
25. &c. &c. at Lasknpore.
26. &c. &c. at Kantrunga
27. &c. &c. at Gandhar
28. Bharat at Nada Village
29. &c. &c. at Sura
30. &c. &c. Sarsodi Nada and Dada Village

II. (SURAT.)

Works in Operation.

31. &c. &c. at Gulsej
32. &c. &c. at Kadod
33. &c. &c. at Sura

34. Weghaj Pumping Works

WEST KHANDESH DIVISION.

Works in Operation.

1. Mukti Tank
2. Tributh do
3. Tapti River Minor Tributaries
4. Upper Panjhra River Group
5. Lower Panjhra River Group
6. Bam River Group
7. Kan &c. &c.

Incomplete Work.

8. Pattonpada Tank

EAST KHANDESH DIVISION.

Works in Operation.

1. Lasnik E. B. Canal
2. Bhamra Tank
3. &c. L. B. &c.
4. Mandal &c.

NASIK IRRIGATION DIVISION.

Works in Operation.

1. Waghad Tank
2. Chaitanpur Tank
3. Kundaneke Tank
4. Girna L. B. Canal
5. Palkhed &c.
6. Wadaki &c.
7. Nasik Tembhar Canal
8. Ozar Tank
9. Girna Group
10. Ajmir Group
11. Mausam &c.
12. Godawari &c.
13. Kadwa &c.
14. Darna &c.
15. Dev &c.
16. Chandwad Group
17. Darna Reservoir (Lake Basin)
18. Wilson Dam (Lake S. Hill)

Works under Construction—Incomplete Work.

19. Odal Tank

PRAVARA CANALS DIVISION.

Works in Operation.

1. Godavari R. B. Canal
2. &c. L. B. &c.
3. Pravara &c. &c.
4. Pravara L. B. Canal
5. Lakh Canal

AHMEDNAGAR DIVISION.

Works in Operation.

1. Shirsodi Tank
2. Khanapdal Tank
3. Pimpalgaon Tank
4. Kanna Tank
5. Mandavgan Tank
6. Pimpalgaon Kavjha Tank

Works under Construction.

1. Visapur Tank

NIRA LEFT BANK CANAL DIVISION.

Works in Operation.

1. Nira L.B. Canal
2. Shirsufal Tank

MUTHA CANALS DIVISION.

Works in Operation.

1. Lake Fife (Mutha Canals)
2. Mundwa Tank
3. Kawadi Tank

Incomplete Works.

4. Khanapur Tank
5. Shivapur Tank
6. Bundelwadi Tank
7. Varvand Tank

LAKE WHITING DIVISION.

Works under Construction.

Lloyd Dam at Shirpur (New Lake Whiting)
Nira R. R. Canal (from mile 0 to 13)

Work in Operation.

1. Lake Whiting

MALSIRAS DIVISION.

Work under Construction

Nira R. R. Canal (from mile 13 to 124).

Work in Operation.

1. Mhaswad Tank

Incomplete Works.

2. Shenkhind Tank
3. Bahdalad Tank

SHOLAPUR DIVISION.

Works in Operation.

1. Hiwla Tank
2. Kolar &c.
3. Pathri &c.
4. Wadgaon-a Tank
5. &c. &c.
6. Kumgaon &c.

Incomplete Work.

7. Mangi Tank

SATARA DIVISION.

Works in Operation.

1. Krishna Canal
2. Mann Dam River Works
3. Upper Man River Works
4. Yerla River Works
Nolur Tank
5. Chikhali Canal
6. Nirmal Canal
7. Ghongaon Tank

Incomplete Work.

BELGAUM DIVISION

Work in Operation.

1. Shedbal Tank

DHARWAR IRRIGATION DIVISION.

Works in Operation.

1. Dambal Tank
2. Mulloor &c.
3. Kanhur &c.
4. Kanhur &c.
5. Mundargi &c.
6. Dharwar and Nargund Canals
7. Gadhaur Tank
8. Gokak Canal—on Ghataprabha and Markandeya Rivers
9. Mardikoppal Tank